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Monthly Message

During the past several years this office has been greatly disturbed over the failure of some of our medical schools to realize and prepare for the demands of the future upon medicine. This was brought to my attention very sharply the other day when I learned that one of our leading medical schools, with entering classes now of only 60 to 65, was planning to move and reduce its classes to a still smaller figure. With our rapidly expanding population and the many new fields of medicine, with added opportunities and needs for physicians, this seems incredible. Bills are introduced into the Congress annually, expressing these needs and providing for the establishment of a Federal medical school. These bills are gaining more and more support, and unquestionably part of the reason for this is the failure on the part of some of our leading medical schools to attempt to meet the pressing needs. Our universities are already making such preparations in their academic departments; and in order to retard the otherwise inevitable march of "socialized or state medicine," our medical schools also must make similar preparations.

Several years ago the State of New York took over the Long Island Medical College and the Syracuse Medical School. At that time they planned that over a definite period of years the classes in these two schools would show a steady increase up to a determined level. This is a good example of what all of our medical schools should be considering. Instead of resisting every effort to increase their classes and planning rather to reduce them, they should inaugurate a definite plan—call it by whatever name one wishes—to increase gradually the size of their classes up to calculated levels. It is far cheaper to proceed along these lines than it is to build new medical schools, and Federal aid for established schools will be more productive in a shorter space of time than will the building of a Federal medical school or schools.

Let us in medicine look forward, not backward, and accept our present responsibilities and the imminent responsibilities of the future.

Frank B. Berry

FRANK B. BERRY
Assistant Secretary of Defense
(Health and Medical)

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Foreword

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal.*

FRANK B. BERRY, M. D.,
Assistant Secretary of Defense (Health and Medical).

MAJOR GENERAL SILAS B. HAYS,
Surgeon General, United States Army.

REAR ADMIRAL BARTHOLOMEW W. HOGAN,
Surgeon General, United States Navy.

MAJOR GENERAL DAN C. OGLE,
Surgeon General, United States Air Force.

UNITED STATES ARMED FORCES MEDICAL JOURNAL

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WHO, ME TEACH?

SILAS B. HAYS, *Major General, MC, USA*

WHY is it that so many leaders in medicine have professorial appointments in medical schools and teaching hospitals? Do they hold these appointments because they are especially competent or, conversely, have they developed competence because they are actively engaged in teaching?

I think the answer to both of these questions must be in the affirmative. It is a truism that the teacher learns more than the pupil, and nowhere is this more true than in the field of clinical medicine. The teacher must consult, read, and study if he is to keep ahead of his pupil. In the discussion of a disease entity or of an individual patient, he is subject to constant question and challenge.

The teaching of clinical medicine is not, and should not be, confined to medical schools and "teaching" hospitals. Every day, all over the world, doctors get together to study and discuss individual cases with a view of determining diagnoses and methods of treatment. While sometimes these discussions or consultations are between doctors of equal professional competence, more frequently they are between a "senior" man and a "junior" man. In the Army, with its general pattern of group practice, such consultations are particularly frequent. In fact this is one of the outstanding attractions of a military medical career.

Are we in the Army making the most of these opportunities to improve our knowledge and competence and thereby improve the quality of our patient care? The solution is not to be found in

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General Hays is the Surgeon General, Department of the Army, having held this office since 1 June 1955.

pious statements of policy, nor in directives emanating from some headquarters. It lies in the development of a teaching atmosphere in all of our medical groups. If each of us develops the habit of teaching every day, we will automatically provide better medical care for each of our patients.

Paraphrasing Shakespeare's *Twelfth Night:* Some are born teachers, some acquire teaching ability, and some have the teaching role thrust upon them. The born teacher can't keep from teaching. In every discussion and consultation he imparts knowledge. I have frequently cited my personal experience with one of our outstanding surgeons, Leonard D. Heaton. In 1932 I reported to old Tripler General Hospital, which then had a small staff and far less than 100 patients. It was definitely not a "teaching" hospital. I was Captain Heaton's assistant on surgery. With Captain Heaton, every case was a teaching case and I learned something from every patient we saw together. Perhaps also some of my questions stimulated him to further reading and study. I know that I profited from every hour. Twenty-three years later I watched Major General Heaton in the operating room at Walter Reed Army Hospital. He was assisting a surgical resident on a case of polyposis of the colon. General Heaton was, just as he was in 1932, explaining and teaching by the "coach and pupil" method. The resident was learning surgery by the best means that has been discovered.

What about those who are not "born teachers"? Teaching skills may be acquired by those willing to take advantage of opportunities. There are only two real requisites—a knowledge of the subject, and a desire to teach. It is the rare individual who finds teaching difficult or embarrassing if he meets these two requirements. On the other hand, if one is uncertain of his knowledge he is naturally reluctant to assume the teaching role. Likewise, if he is not motivated to teach he lets his opportunities slide. But the inescapable fact is that teaching itself forces deeper thought and stimulates more study. Teaching is not only an altruistic action to help the other fellow. It is also a means of self-advancement; a most honorable means. The best way to acquire teaching skill is to teach. It is never too early or too late to start.

What can we do about this? As Surgeon General of the Army, I am interested in constantly improving the quality of our patient care. Aside from this—and the two are inseparable—I am also interested in improving the professional stature and over-all competence of all Army doctors. The difficult part of this program is that what is everybody's responsibility is usually nobody's

responsibility. On the other hand, the easy part of the program is that everyone can do something about it either on his own or as a participant in an organized effort. The individual doctor not only can develop the teaching attitude in himself but he can help evolve a teaching atmosphere in his organization. The service chief can encourage ward rounds, conferences, journal clubs, and many other activities which center around teaching. The commander can likewise do much. He can arrange symposiums and clinical pathologic conferences and encourage talks by the staff. He can encourage timid and reticent individuals to speak in open meetings. He can invite medical officers from other units and doctors from the civilian community to attend professional meetings. He can stimulate good relationships with the local medical society and arrange for participation in programs. Often, by precept a spark thrown off from a leader will set ablaze the fire smoldering in the mind of one whose capabilities have not yet been recognized. Because good teaching further improves good patient care and elevates the competency of doctors in the Army, I am determined to constantly strengthen our teaching capabilities and facilities. Each Army hospital must have its staff actively interested in teaching and learning.

My discussion has concerned doctors of medicine, but is not restricted to them. It embraces all members of the Army Medical Service—dentists, veterinarians, nurses, psychologists, chemists and all professional groups, administrative officials, civilian employees, and enlisted personnel. Learning is unaware of rank. We all gain knowledge from our "juniors," as well as our "seniors." Enlisted personnel constantly make valuable contributions to teaching and patient care.

This is a program in which nobody loses and everybody gains: the patient, the teacher, the pupil, and the Army Medical Service. I urge all to teach.

CLOSING OF ATRIAL SEPTAL DEFECTS WITH THE AID OF HYPOTHERMIA

DAVID E. THOMAS, *Lieutenant Colonel, MC, USA*

ATRIAL SEPTAL defects, which are possibly the most common of the isolated congenital anomalies of the heart, have been treated by a variety of closed operative technics. Gross and associates[1] used a rubber "well" attached to the right atrium and, as a result of the low pressure in this chamber, were able, working through a pool of blood, to leisurely close the atrial septal defect with sutures. Bailey and co-workers[2] used a method involving inversion of the atrial tip into the septal defect, blindly suturing it in this position. Søndergaard's[3] technic consisted of dissecting in the interatrial septum between superior and inferior vena cava and, with a finger in the auricle for guidance, passing a needle with suture about the defect. This suture was tied by the assistant, the operator's intracardiac finger checking on the closure obtained.

Of these methods, that of Gross seems most practical, but all are deficient in that visualization is not possible. It is well known that atrial septal defects are often cribriform and it is not unusual to find a large defect with several small ones. Inadvertent failure to close all defects must occur in any method not done under visualization. In addition, detection and correction of associated anomalies such as pulmonary venous drainage into the right auricle is possible under visualization, and the coronary sinus may be protected from partial or complete occlusion by a suture.

Lewis and Taufic[4] reported the first successful case of interatrial surgery under direct vision during hypothermia in 1952. Since then, numerous reports have appeared in the literature. Swan and his group[5] have been particularly prominent in this field, and we are indebted to them for leadership and guidance at this hospital. It would seem obvious that, if the operation can be performed with a mortality comparable to that of the closed technics, repair of interatrial septal defects by direct

From Fitzsimons Army Hospital, Denver, Colo. Col. Thomas is now assigned to Valley Forge Army Hospital, Phoenixville, Pa.

vision under hypothermia is the procedure of choice and will yield a higher percentage of successful closures. With this objective in mind, let us evaluate our results.

METHOD

This study includes 18 operations from 1953 through 1956. Two of these were reoperations. Seventeen were performed with the aid of hypothermia and 1 with the bubble oxygenator described by DeWall and associates.[6] The technic of cooling and operation has been thoroughly described by Salyer, Lyter, and Pollock[7] and will not be repeated.

Age at Operation. Ages varied from 4 to 38 years. Ten patients were less than 10 years of age, 4 were 20 to 30, and the remaining 4 were 30 to 38 years of age.

History. In general, a history of retarded growth, dyspnea on exertion without cyanosis, and frequent respiratory infections was obtained. The lack of cyanosis is to be expected, because the shunt is from left to right. The severity of symptoms varied from asymptomatic, the lesion being discovered as the result of a prenatal examination, to very severe with marked limitation of activity.

Physical Findings. The patients were generally underdeveloped and underweight. The left anterior portion of the chest may be prominent and a thrill or shock is often felt in the pulmonic area. The heart is enlarged to percussion. A soft systolic murmur is heard along the left sternal border. The second heart sound is duplicated and loud, and a soft diastolic murmur may be present.

Roentgenograms. There was increased vascularity of the lung fields, enlargement of right auricle and ventricle, posterior displacement of the esophagus by the right auricle on barium swallow and, on fluoroscopy, increased pulsation of the pulmonary artery.

Cardiac Evaluation. Electrocardiograms often showed incomplete right bundle branch block and evidence of right ventricular hypertrophy. Cardiac catheterization revealed evidence of a left to right shunt at the atrial level with increased oxygenation of the blood. Mild to marked right ventricular and pulmonary artery hypertension was frequent. Pulmonic to systemic circulation ratios ranged to a high of 4 to 1.

RESULTS

Table 1 lists the complications of the procedure in our series. There were 2 deaths in 18 procedures, a mortality rate of 11

per cent. Neither of these deaths were considered to be a result of hypothermia. One was due to bronchopneumonia on the third postoperative day. The other was first thought to be caused by pulmonary embolism, the patient dying suddenly on the day she was to leave the hospital. This impression was not confirmed by autopsy, which showed no definite cause of death. Inasmuch as she exhibited ventricular fibrillation during the operation and developed auricular flutter which responded to digitalis and quinidine during the postoperative period, it was believed that she probably died as a result of ventricular fibrillation.

TABLE 1. *Complications*

Ventricular fibrillation	4
Atelectasis	2
Pneumonitis	2
Bronchopneumonia	1
Bilateral common peroneal palsy	1
Incomplete closure	1

Incomplete closure was diagnosed in a 5-year-old boy when he failed to improve following surgical intervention. Reoperation was successful.

Of the remaining complications, the only one of importance was the bilateral common peroneal palsy. This unusual complication occurred in a 29-year-old man who required four electric shocks at 165 volts for 0.1 second to stop ventricular fibrillation during the operation. He had anomalous pulmonary venous drainage into the right auricle from the right lung. The ventral portion of the atrial defect was sutured to the right auricular wall on the right side of the anomalous pulmonary veins, thereby shifting the venous return to the left auricle. In spite of these problems, circulatory occlusion did not exceed 5 minutes, which is well within the safe range. This patient is exhibiting a slow return of function, but still requires foot-drop braces.

Anomalous right pulmonary venous drainage was diagnosed preoperatively in another patient as a result of catheterizing a right pulmonary vein during cardiac catheterization. This additional defect was remedied by the method previously described, with good result. Artificial oxygenation with the bubble oxygenator was used during this procedure. No septum primum defects were encountered in this series.

The other reoperation was on a patient who had previously had a polyethylene button sutured over the defect under hypothermia

at another hospital. At operation at this hospital, the button was found to be covered with endothelium, but one suture had pulled out. The button was resutured with good result.

Follow-up evaluation is available on 13 patients. Eleven of them report weight gain, increased strength and vigor, and unlimited activity. One patient has residual symptoms from peroneal palsy and one, diagnosed preoperatively as having a psychogenic musculoskeletal disorder without true cardiovascular symptoms, reports no postoperative improvement.

COMMENTS

Rapid advances in cardiac surgery during recent years have posed the problem of comparing various technics and selecting the one best suited for correction of a specific anomaly. This small series of cases indicates that under direct vision with the aid of hypothermia, atrial septal defects can be closed successfully and completely with an acceptable mortality rate. The postoperative improvement of the patients is uniform and gratifying. The open heart method of repairing this defect is considered to be technically superior to any of the closed methods. Necessary intracardiac manipulations can be completed well within the eight-minute safe period of vascular occlusion. In fact, the operations on these patients were all completed within five minutes, insofar as the intracardiac portion of the procedure was concerned. It is possible to repair the defect in three minutes in a straightforward case with a foramen ovale type of central defect. It has never been necessary to do so, but, should the time within the open heart approach eight minutes, the procedure could be temporarily interrupted, circulation and respiration be re-established, and the heart be re-entered after an adequate interval.

Air embolism has not been a problem, because the left heart is flooded with physiologic saline solution through the defect just prior to tying the last suture. The right auricle and ventricle are similarly flooded prior to clamping off the incision in the auricular wall. The coronary arteries are protected from air embolism by placing the clamp that occludes the aorta and pulmonary artery low enough to occlude the coronary ostia.

Ventricular fibrillation has been a problem, but not an insurmountable one in this series. For the past year, we have injected Novocain (brand of procaine hydrochloride) into the sino-auricular node area, as recommended by Riberi, Siderys, and Shumacker,[8] but a firm opinion of the value of this procedure has not been formed. Fibrillation has occurred after Novocain injection of the S-A node area. Ventricular fibrillation is ignored

during the open heart portion of the procedure, but massage is started as soon as the incision in the right auricular wall is clamped. Massage and electrical defibrillation have been successful in restoring normal rhythm. Intracardiac injections of dilute epinephrine and calcium chloride solution are occasionally used as ancillary measures. We have not employed intracoronary infusions of potassium solutions to induce cardiac standstill.

SUMMARY

Atrial septal defects have been treated by a variety of closed operative technics. Direct visualization during operation permits (1) more complete closure of the defect, (2) detection and correction of associated anomalies such as pulmonary venous drainage into the right atrium, and (3) protection of the coronary sinus from partial or complete occlusion by a suture.

From 1953 through 1956, 18 operations for closure of atrial septal defects were performed under hypothermia at this hospital. There were two postoperative deaths. One, on the third postoperative day, resulted from bronchopneumonia. The other, at the time the patient was ready to leave the hospital, probably was caused by ventricular fibrillation.

This small series of cases indicates that under direct vision with the aid of hypothermia, atrial septal defects can be closed successfully and completely, with an acceptable mortality rate. The postoperative improvement of the patients was uniform and gratifying. The open heart method of repairing this defect is considered to be technically superior to any of the closed methods.

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USE OF ANORGANIC HETEROGENOUS BONE IN ORAL BONY DEFECTS

PHILIP J. BOYNE, *Lieutenant Commander, DC, USN*
FRED L. LOSEE, *Captain, DC, USN*

THE organic fraction of bone may be removed by extraction with ethylenediamine, with a minimum of alteration in the structure and composition of the inorganic component.[1,2] The resulting osseous product, consisting of a porous crystalline and noncrystalline lattice, has been termed "anorganic bone" and has served as a successful foundation for new bone growth in defects of the long bone of dogs.[3]

This pilot study was undertaken to evaluate clinically the use of animal anorganic bone in patients undergoing selected oral surgical procedures. It was thought that a clinical evaluation of the oral tissue response could be obtained by implanting anorganic cortical bovine bone particles into bony defects following relatively minor operative procedures.

Boyne and Losee[3-5] found that the placing of anorganic bovine bone particles in surgically created bony defects of the mandible and maxilla of rhesus monkeys was followed by uneventful clinical healing with a complete absence of any evidence of a foreign body reaction. Histologic specimens of the implanted defects demonstrated reactive bone formation surrounding the anorganic particles as early as 13 days postoperatively. The anorganic particles were rapidly remodeled with new bone formation from the host tissue.

It is believed that on the basis of this previous experimental work on the rhesus monkey, ethylenediamine-extracted animal bone offers a new source of osseous tissue which could be applied to many oral surgical procedures as a substitute for fresh autogenous bone, banked homogenous bone, or various alloplastic materials.

Such a substitute is particularly applicable to the military service where there is need of an inexpensive, readily avail-

From Dental Service, Naval Dispensary, Department of the Navy, Washington, D. C., and Dental Division, Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md.

able source of osseous tissue for use in the treatment of traumatic injuries in the event of a national emergency.

The purpose of this study was not to compare anorganic animal bone implants with autogenous or homogenous bone transplants, but merely to establish whether the implanting of anorganic bone particles into oral bony defects of man would be followed by the same clinical and roentgenographic pattern as that observed in the monkey following the filling of similar defects with the same material.

A total of 18 anorganic heterografts were placed in various types of bony defects. Three of these implants were placed in the bone cavities following the enucleation of radicular cysts, 6 were placed in periapical bony defects following endodontic therapy and periapical curettage, 3 were placed following enucleation of nasopalatine duct cysts, and 6 were placed in the bone alveoli following tooth extraction. In all patients, healing was uneventful; postoperative edema and ecchymosis were minimal and no untoward reactions were observed. In no case was there any clinical evidence of foreign body response by the oral tissues. In some patients, immediate denture prostheses were inserted over the operated areas without discomfort to the patient and the tissues healed rapidly beneath the prosthetic appliances.

The length of the postoperative follow-up periods varied from 10 to 20 weeks. Roentgenograms taken 6 weeks postoperatively demonstrated a tendency toward uniformity of bone density between the grafted areas and the surrounding bone; the development of an apparently normal trabecular pattern was demonstrated in the latter part of the postoperative course.

Two representative cases are briefly reported to demonstrate the use of this material.

CASE REPORTS

Case 1. A 32-year-old man first reported to the dental clinic with the complaint of "pain and swelling of the upper jaw." A preoperative roentgenogram (fig. 1) disclosed a large radiolucent area in the edentulous right maxilla, extending from the apex of the right cuspid tooth medially to join another radiolucent area in the midline of the maxilla. At operation these cystic areas in the maxilla were enucleated and anorganic bovine bone particles were implanted in the bony defects. The left lateral incisor and the right cuspid were removed. A partial denture was inserted over the area at the time of the operation. On microscopic examination the cystic areas proved to be a radicular and a nasopalatine duct cyst. Figure 2 is a roentgenogram taken one week postoperatively. A roentgenogram made six weeks postoperatively

Figure 1 (case 1). Preoperative roentgenogram demonstrating large radiolucent area in edentulous right maxilla.

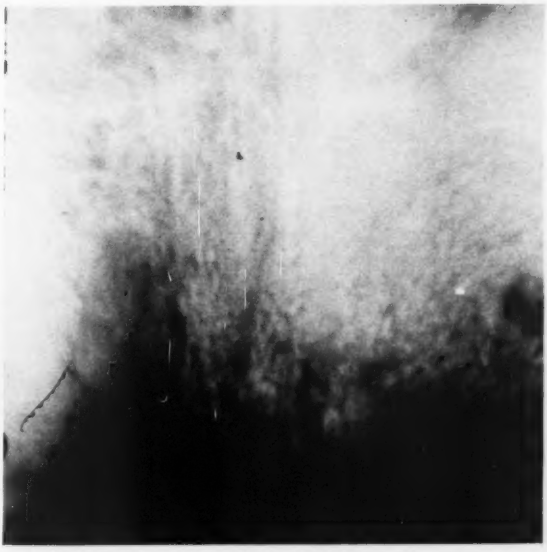

Figure 2 (case 1). Roentgenogram taken one week after enucleation of cysts and implantation of anorganic bone particles.

(fig. 3) revealed a tendency toward uniformity of density of the osseous tissues. None of the implanted bone particles had been extruded or exfoliated. Clinically, the edentulous ridge was firm and well healed.

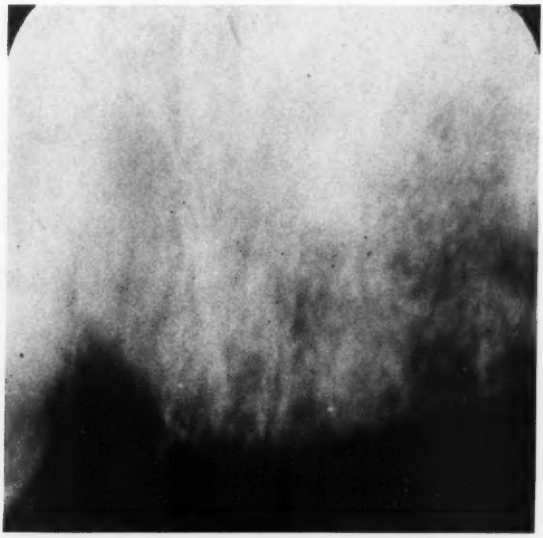

Figure 3 (case 1). Appearance on roentgenogram six weeks postoperatively.

Figure 4 (case 2). Operative site showing bony defect following enucleation of cyst.

Case 2. A radicular cyst involving the left upper central and lateral incisor teeth of a 24-year-old man was enucleated by periapical curettage. The bony defect remaining after the enucleation is shown in figure 4. It was possible to retain the involved teeth by endodontic therapy. Figure 5 shows the operative site following the placing of anorganic bovine bone particles in the bony defect. The mucoperiosteal tissues were closed over the implanted bone particles. Healing was uneventful.

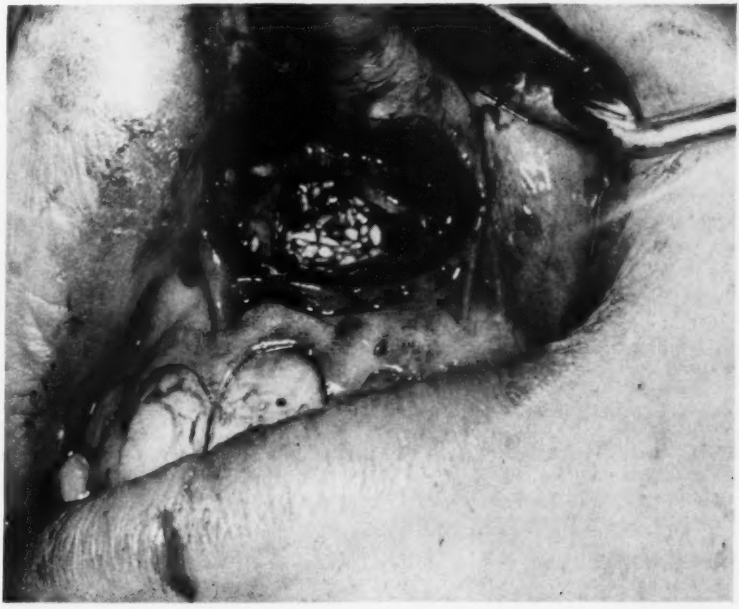

Figure 5 (case 2). Operative site after placing anorganic bone particles in the bony defect.

SUMMARY AND CONCLUSIONS

The organic portion of bovine bone was extracted with ethylenediamine. Particles of the remaining anorganic bovine bone were used as grafts in 18 bony defects created by relatively minor oral operative procedures. The bony defects in each case were slightly underfilled and a close adaptation of the mucoperiosteal flap was obtained. The absence of any inflammatory response clinically and the retention of the graft, without extrusion or exfoliation of the graft particles, were indicative of initial clinical host acceptance.

Limitations, both in the number of cases reported and in the length of the follow-up periods, preclude the establishing at this time of any definite conclusions as to the ultimate fate of

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these implanted anorganic heterografts. The absence of any clinical evidence of foreign-body reaction on the part of the host, however, and the character of the postoperative roentgenograms indicate a pattern of host acceptance similar to that found in animal experimentation (implantation of anorganic bone in the long bone of dogs and in oral bony defects of monkeys).

Anorganic bone is easily manipulated. It may be kept at room temperature and need not be stored under sterile conditions or in an antibiotic solution, because it is autoclaved just before its use in an operation. This material appears to be adaptable to the surgical technics used for the insertion of autogenous or banked homogenous bone particles in bony cystic defects of the oral cavity (*e. g.*, freeze-dried homogenous bone[6, 7]).

It is believed that further studies on the clinical and roentgenographic long-term status of anorganic bone grafts will indicate a definite application of this material to many oral surgical procedures.

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RELATION OF PLASMA PEPSINOGEN LEVELS TO ETHNIC ORIGINS

Implications in Duodenal Ulcer

SYDNEY H. CROOG, *First Lieutenant, MSC, USAR*

RECENT research has indicated that 87 per cent of patients with duodenal ulcer have higher blood plasma pepsinogen concentrations than do normal subjects.[1] In addition, it has been suggested that under appropriate circumstances, persons with comparatively high levels of serum pepsinogen are more likely than others to develop duodenal ulcer.[2] Although further study is necessary to establish and clarify the exact nature of this phenomenon, the elevation of plasma pepsinogen may prove useful in the diagnosis and possibly in the prediction of duodenal ulcer.

The present article reports an effort to determine whether certain specific ethnic groups in the population differ significantly in their serum pepsinogen level. This study is preliminary to future analysis of relationships between elevated pepsinogen level, duodenal ulcer, and personal and social factors. The relationships may indicate how further investigation of pepsinogen and ulcer should proceed. Reports on the relation of ethnic origins and pepsinogen to duodenal ulcer are rare in the literature for this is a recent line of inquiry. The incidence of ulcer in various nations and racial groups has been reported;[3-6] however, differences in methods and in thoroughness of compilation preclude extended comparison.

METHOD

Two thousand newly inducted soldiers were chosen at random from the processing center at Fort Dix, N. J., during an eight-week period in the fall of 1954. All were young men who had recently been subjected to several physical examinations and were presumed to be in good health. Their mean age was 21.1

From Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D. C. Dr. Croog is now at The Children's Hospital, 300 Longwood Ave., Boston, Mass.

years. As new basic trainees, all were faced with the stresses and uncertainties involved in military induction.

Of the total sample of 2,000 men, 1,900 qualified for inclusion in the present study by fulfilling these criteria: (1) All were born in the continental United States, (2) each contributed a blood sample which was analyzed for pepsinogen, and (3) each completed a sociologic questionnaire designed by the author. From this number the selection of ethnic subpopulations was made.

Blood samples were sent daily for determination of plasma pepsinogen levels. A numerical "pepsinogen score" was obtained by expressing the proteolytic activity of the plasma as micrograms of "tyrosine" released by the action of 1 ml of plasma at pH 1.5 in the standard assay procedure.

The sociologic questionnaire consisted of items dealing with the social background of the inductee, his parents, and his grandparents. Both the blood samples and the sociologic questionnaires were identified by code numbers. Sociologic material and the pepsinogen scores were held separate until the final phase when both sets of information were transferred to IBM cards.

Ethnic groups were differentiated solely on the basis of operationally defined traits. Those inductees who on the sociologic questionnaire identified *both* parents as being of a specified ethnic origin were included in that group. Inductees who recorded the religion of *both* parents as Jewish at birth were included in the Jewish sample, and men who listed *both* parents as of the Negro race were classified as belonging to the Negro sample. The Negroes are obviously a racial group, but for the sake of brevity, the term "ethnic group" is used throughout this article for the Negro as well as for the other four subpopulations.

Five groups were selected. In order of size they were of the following origins: Jewish (347); Italian (302); Irish (212); German (91); and Negro (64). They totaled 1,016 men, representing an approximate 50 per cent of the original random sample. The majority of inductees, with the exception of the Jews and Negroes, reported that three or four of their grandparents were born in the specific country of national origin, with the remainder reporting that at least one grandparent was born there. The majority of Jewish inductees also recorded the European birth of all four grandparents. The Negroes were the only men whose grandparents were virtually all of native American birth.

The locale where the research was done, Fort Dix, N. J., affected the ethnic composition of the sample. Men processed

through Fort Dix are primarily from the northeastern United States, an area in which a variety of recent immigrant groups are concentrated.

A large proportion of the sample, moreover, was made up of men from urban centers of population; 42 per cent, for instance, were from New York City. Less than 2 per cent came from rural or farm areas. Eighty per cent of the total sample came from two states, New York and New Jersey, with the majority of the remaining men originating in New England states.

The entire sample of 1,900 men for whom data on both pepsinogen and social background were available was classified into deciles in terms of pepsinogen level. From the total population the five special groups of inductees were selected by means of criteria already described. The distributions of scores for these groups were then subjected to statistical analysis.

RESULTS

When the mean scores for each of the ethnic groups are examined, differences in elevation of pepsinogen level are apparent. In table 1 the groups are ranked in terms of size of the mean. The mean for the Irish inductees is the highest, while the Italians and Jews are the two lowest groups in terms of mean pepsinogen score. The range between means for the Irish and Jewish groups is from 422 to 518 points, a difference of almost 100. The difference between the highest mean, the Irish, and the second highest, the Negro, is a spread of 68 points. On the other hand, with the exception of the Irish, means of all the groups are clustered within a range of 28 points, *i. e.*, the range between the means of the Jewish and Negro groups.

TABLE 1. *Plasma pepsinogen levels of ethnic groups*

Nationality	Number in sample	Mean plasma pepsinogen*	Standard deviation	Level of significance of F ratio when compared with Irish
Irish	212	518	226.6	
Negro	64	450	219.5	Not significant
German	91	444	188.5	$p < 0.01$
Italian	302	432	199.3	$p < 0.001$
Jewish	347	422	179.0	$p < 0.001$

*Expressed as micrograms of "tyrosine" released by the activity of 1 ml of plasma in the standard assay.

An analysis of variance was performed in which all six ethnic groups were compared. The resulting F ratio indicated a difference between groups which was significant at the 0.001 level of probability. Further, in view of the size of the mean of the Irish sample, analysis of variance tests were carried out in which each of the other groups was compared with the Irish. These results are recorded in table 1 in terms of the level of significance of the F ratio. All groups with the exception of the Negroes differ significantly from the Irish, as far as the pepsinogen distributions are concerned. Levels of "p" were 0.01 in the case of inductees of German origin and 0.001 in the cases of inductees of Italian and Jewish origin.

Aside from the Irish, none of the remaining four groups differs significantly from the others in analysis of variance tests. The position of the Negroes, however, is an intermediary one. While the distribution of scores of the Negro group does not differ from the three groups with lower means, neither, on the other hand, does it differ from the Irish in analysis of variance. The size of the Negro group is the smallest in the sample, and it is possible that its intermediary position might be altered in more definitive terms one way or another if its size were increased.

Parental Birthplace and Pepsinogen Level in Irish Group. Because of the significantly high level of Irish pepsinogen scores, the group was subjected to special analysis. Explorations were made into the possibility that the Irish inductees, more than any other group in the sample, were the product of mixed national origin backgrounds and that these mixed backgrounds might conceivably influence scores. It was hypothesized that because of greater opportunity for intermarriage those inductees who were the descendants of the earlier Irish immigrants would differ in pepsinogen score from those men who were the sons of the most recent immigrants. Accordingly, the pepsinogen scores of the Irish inductees were examined in terms of birthplace of parents as well as birthplace of grandparents. Those Irish inductees whose four grandparents were born in Ireland (86 in number) were compared with those who had one or more grandparents born in a country other than Ireland (126 in number). No significant differences between the pepsinogen scores of these two groups were found in the chi-square test ($X^2 = 1.337$; $p<.50$).

In addition, comparisons were made between scores of those soldiers whose parents were both born in Ireland (56) and those whose parents were both born in the United States (76). Again no significant differences were found by the chi-square test ($X^2 = 1.199$; $p<.50$). It may be concluded, therefore, that differ-

ences in the birthplaces of grandparents or parents did not significantly affect pepsinogen scores for the Irish group.

Relation of Social Variables to Pepsinogen Levels. In the literature on ulcer a number of studies cite social variables such as occupation, mobility, family structure, and other factors as being of significance.[9-14] In the light of these writings, an effort was made to test the significance of a number of variables in the total sample population and within each of the three largest groups, the Irish, Italians, and the Jews. On the assumption that a high pepsinogen level implies particular proneness to duodenal ulcer, the purpose was to determine whether men in certain broad social groupings or social situations might have higher scores than others. The Index of Status Position and an occupational scale devised by Professor August B. Hollingshead of the Department of Sociology, Yale University, were used.

The following items were examined in relation to pepsinogen level: (1) occupation of the inductee before entering the Army, (2) educational level of the inductee, (3) occupation of the father, (4) social class of the father, (5) occupational ambitions of the inductee in relation to his father's occupation as an index of mobility, and (6) differences between parents and the inductee regarding the occupational ambitions of the youth. No significant statistical relationships were found. The negative results indicate that (1) either no relationships exist between pepsinogen level and the individual variables examined or (2) the technics used were not sufficiently sensitive to detect such a relationship.

COMMENTS

While the Irish inductees were found to have significantly higher pepsinogen scores than the other groups, the meaning and implications of the results are not clear. Obviously it is not simply the fact of being of Irish national origin which underlies the results, but rather that the Irish have certain traits in common more than any other group in the sample. These traits presumably are causal or influential in producing elevated levels of plasma pepsinogen. The literature contains a wide variety of hypotheses concerning the origins of ulcer, ranging from theories on genetic, constitutional, dietary, neurologic and endocrine factors, to explanations in terms of emotions and the unconscious mind. Within this theoretical setting the precise identification of the variables which lead to high pepsinogen levels is an additional area for rigorous empirical work.

Replication of research is a basic principle in the development of theory in science. In the present study, the number in

the groups, particularly the Negro group, makes repetition of the study desirable. However, since the exploratory work indicates significant differences between certain groups, it is possible for future investigations to concentrate on underlying variables while at the same time duplicating the study.

Because the Irish appear to be a special group in terms of plasma pepsinogen, the research might conceivably be repeated with comparative ease in Ireland where large samples are available. The essential test of measuring plasma pepsinogen can be set up as a routine matter of laboratory procedure. Similarly, research might be performed in Italy and among Jews of eastern European origin in Israel, as these represent groups with low mean levels of pepsinogen.

One of the ultimate aims of research in this area is the validation of the proposition that high pepsinogen level is an indication of the likelihood of developing duodenal ulcer. Accordingly, an ideal study would be concerned with the actual incidence of ulcer within subcultural groups which exhibit elevated plasma pepsinogen levels. Either a longitudinal approach or a latitudinal study with selected age levels might be used. From multidimensional research answers may emerge to clarify some of the current medical problems and controversies concerning the origins, course, and therapy of duodenal ulcer.

SUMMARY

Comparisons of plasma pepsinogen levels in five operationally defined ethnic groups were made in order to determine differences in pepsinogen score. The underlying assumption, based upon reports in the literature, was that elevated levels of blood pepsinogen are indicative of a tendency to develop duodenal ulcer. The five groups consisted of 1,016 Army inductees who passed through the processing center at Fort Dix, N. J.

The mean pepsinogen score of the inductees of Irish origin was the highest of the five groups, differing significantly from the scores of the German, Italian, and Jewish men. The Negro group, however, stood in an intermediary position between the Irish and the others, differing significantly from none of them. Lowest pepsinogen level scores were found among the Italian and Jewish inductees. The implications of the results were discussed with emphasis on the advisability of repeating the study in the individual countries of national origin.

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EPIDEMIC RHEUMATIC FEVER

Problems in Control at a Recruit Training Base

BERNARD M. REEN, *Captain, USAF (MC)*
NORBERT SCHALET, *Captain, USAF (MC)*
HAROLD B. HOUSER, *M. D.*

THE EXACT nature of the well-known relationship between group A streptococcal infections and rheumatic fever has not been established. In a recent discussion of the pathogenesis of rheumatic fever, McCarty[1] pointed out many of the unanswered problems concerning the role of the streptococcus. Fortunately, although these problems exist, preclusion of rheumatic fever by either prophylaxis or adequate therapy of streptococcal infections is well recognized. The principles of prevention of recurrent rheumatic fever are well accepted and practicable; however, they are more difficult to apply for the prevention of initial attacks.

As shown by studies at the Streptococcal Disease Laboratory, Francis E. Warren Air Force Base, Wyo.,[2-4] first attacks of rheumatic fever can be prevented when the preceding streptococcal infections are adequately treated with penicillin or broad-spectrum antibiotics. Hubbard[5] recently discussed the difficulties of preventing initial attacks in the general population, and suggested that the "captive population" at a military installation would be an ideal group in which to treat acute streptococcal infections for prevention of rheumatic fever.

Experience at Sampson Air Force Base during the winter of 1954-1955 has shown that, even in a military population, prevention of first attack rheumatic fever by treatment of streptococcal disease leaves much to be desired. This article outlines

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From Laboratory on Housing and Illness, Armed Forces Epidemiological Board; and Department of Medicine, State University of New York, Upstate Medical Center, Syracuse, N. Y.; and Preventive Medicine Section, U. S. Air Force Hospital, Sampson Air Force Base, N. Y.

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some of the difficulties in such a program and the specific measures employed at this base to reduce the incidence of rheumatic fever.

MATERIALS AND METHODS

Sampson Air Force Base, situated in an endemic streptococcal region in central New York State, was a primary basic training base for recruits. The average trainee population varied from 10,000 to 22,000 men.

A throat culture was obtained from all patients admitted to the base hospital with respiratory disease. Strains of beta hemolytic streptococci isolated from these cultures were identified by Lancefield group and type.

The hospital charts of all patients with a discharge diagnosis of acute rheumatic fever with an onset between 4 November 1954 and 1 August 1955 were reviewed. The diagnostic criteria employed in this review were those of Jones,[6] with evidence of recent streptococcal infection as an additional minor criterion. Admittedly, some cases of acute rheumatic fever with mild manifestations were excluded, but the application of these criteria assured us of a measure of uniformity in the series.

In order to include only patients with rheumatic fever who were likely to have developed their preceding streptococcal infections at this base, cases of rheumatic fever occurring less than 10 days after a man's arrival were excluded. In addition, no rheumatic fever patients received here by air evacuation from other bases were included. Permanent party personnel from this base were not included in the analysis.

RESULTS

Of 122 discharge diagnoses of rheumatic fever during the study period, 98 met our criteria and are included here. Seventeen of the remaining 24 probably were rheumatic fever with mild manifestations. The other seven were excluded as permanent party, air evacuees, or on the basis of a different diagnosis. The time of onset of the disease in the 98 patients was ascertained from the recorded history and is presented in figure 1.

The hospital admission rate of patients exhibiting ten or more colonies of group A streptococci on admission throat culture is shown in figure 2. Although some of these persons may have been carriers, it is thought that in most instances the admission was for streptococcal pharyngitis. The predominant type of group A streptococcus throughout the study period was 19.

Examination of figure 2 shows that the admissions rate for streptococcal pharyngitis rose rapidly during the late fall months

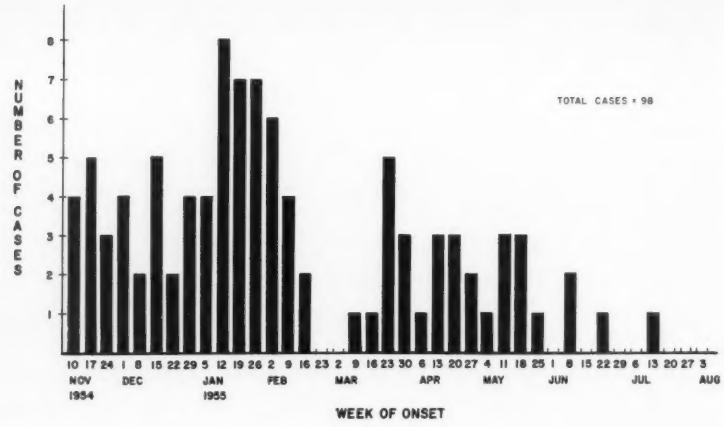

Figure 1. The occurrence of acute rheumatic fever at a recruit training base, November 1954 to August 1955.

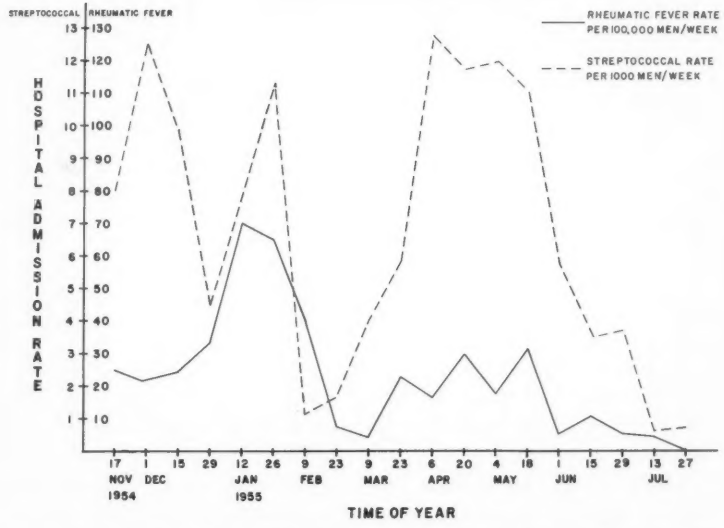
STREPTOCOCCAL
RHEUMATIC FEVER
HOSPITAL ADMISSION RATE
RHEUMATIC FEVER RATE PER 100,000 MEN/WEEK
STREPTOCOCCAL RATE PER 1000 MEN/WEEK
17 1 15 29 12 26 9 23 9 23 6 20 4 18 1 15 29 13 27
NOV DEC JAN FEB MAR APR MAY JUN JUL
1954 1955
TIME OF YEAR

Figure 2. Hospital admission rates for streptococcal pharyngitis and rheumatic fever at a recruit training base, November 1954 to July 1955.

to a peak of 12.5 cases per week per 1,000 men; dropped remarkably in late December, coincident to the Christmas and New Year's leave period; and then rose rapidly to a peak of 11.3 by 26 January. At this point penicillin prophylaxis was ad-

ministered on a base-wide scale, and the rate dropped off precipitously. The results of this prophylaxis will be presented in detail elsewhere.[7]

The rate began to rise again in the early weeks of March and reached a peak of 12.7 by early April. This rate was sustained until mid-June and thereafter fell off to negligible levels for the summer.

The coincident rate of rheumatic fever is also presented in figure 2. It can be seen that the rate rose with the increased hospital admissions for streptococcal disease, reaching a peak of 70.2 cases per week per 100,000 men by 12 January 1955, and fell off at the time of penicillin prophylaxis. Two weeks after the streptococcal rate again began to rise, the incidence of rheumatic fever began to increase. Although the streptococcal hospitalization rate again reached proportions similar to those earlier in the season, the concomitant rise in rheumatic fever was less than earlier. The reasons for this observation merit close scrutiny.

DISCUSSION

Several possible explanations for the failure of the rheumatic fever rate to parallel the streptococcal rate in the second half of our reporting period present themselves. The factor of host susceptibility to beta hemolytic streptococcal infections has long been discussed. Certainly some families have a higher rheumatic fever incidence than the normal population, and the tendency of rheumatic fever subjects to have recurrences of their disease is well recognized. These people might then be considered to have an increase in host susceptibility to rheumatic fever. Without debating the point of familial factors in rheumatic fever, they would seem to be of little importance in explaining the difference in rheumatic fever response to the streptococcal rates in the two periods of our series. In a population as large and heterogeneous as that dealt with at a military training base, the proportion of susceptible persons should be similar at any time throughout the year. As far as recurrent rheumatic fever is concerned, such cases accounted for proportionately as many admissions in the period before penicillin prophylaxis as in the period after it.

The effect of season on the incidence of rheumatic fever might be a factor in the observed differences, but the weight of evidence indicates that the seasonal variation merely reflects the seasonal incidence of streptococcal infections.[8] Another explanation of the observed variation might be the presence of a particularly virulent rheumatogenic strain of streptococcus in

the early part of the winter. This seems unlikely in view of the fact that there was no type change in the streptococci responsible for disease during the two periods. In addition, there is little evidence that group A strains vary in their rheumatogenic capacity. We believe that the disparity in the streptococcal and rheumatic fever rates during the second half of the winter can be explained best as the result of specific measures which were instituted.

It must be remembered that these streptococcal rates represent only hospital admissions and are not a true measure of the total streptococcal disease on the base. If we assume that the patients with streptococcal disease recognized in the hospital were adequately treated, then we can expect up to 90 per cent reduction in the development of rheumatic fever in this group.[9] In fact, only 3 of the 98 patients with rheumatic fever seen during the winter had been hospitalized for a preceding streptococcal infection. Of these, two had received three and four days of penicillin therapy, respectively, while the third had not received any penicillin. We believe that the remainder of the patients with rheumatic fever seen during the winter had had streptococcal infections that were undiagnosed and untreated or, if diagnosed, were inadequately treated without admission to the hospital.

If, as is generally accepted, about 3 per cent of untreated patients with group A streptococcal infections will develop rheumatic fever,[10] then any given group of patients with rheumatic fever can be considered to be 3 per cent of the total number of those who had undiagnosed or inadequately treated streptococcal infections 2 to 3 weeks prior to the onset of the rheumatic fever. From this assumption, it is then possible to estimate the total number of cases of streptococcal disease present in a group. Figure 3 shows a comparison of the hospital admission rate in this series with the assumed incidence of streptococcal pharyngitis among the total recruit population. The assumed rate was calculated by adding to the hospitalization figures the number of cases that must have occurred to account for the rheumatic fever that developed. To allow for the latent period, the cases assumed to have occurred to account for the incidence of observed rheumatic fever have been moved back two weeks from the time of onset of the rheumatic fever.

It can be seen from figure 3 that during the weeks prior to penicillin prophylaxis a great many cases of streptococcal infections were either not recognized or inadequately treated on a dispensary level. Little more than one quarter of the estimated cases of streptococcal disease reached the hospital, whereas

after the period of penicillin prophylaxis, over 50 per cent of the estimated streptococcal cases were hospitalized and adequately treated.

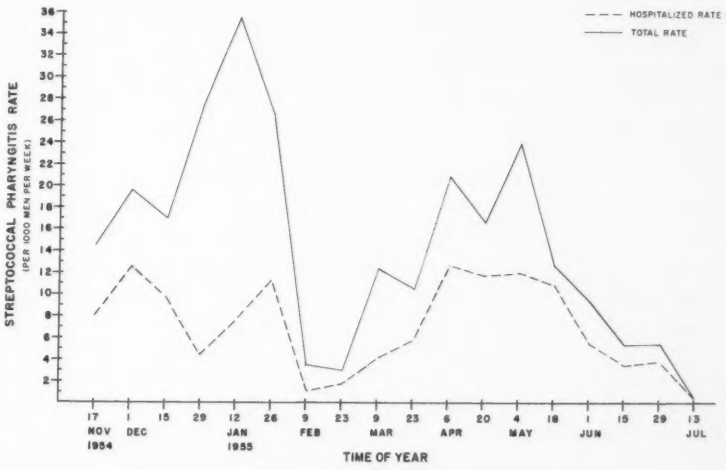

Figure 3. Hospital admission rate and assumed total rate for streptococcal pharyngitis in recruits, November 1954 to July 1955.

We believe that several factors, some of which are peculiar to a military population, were responsible for this increase in the detection and treatment of streptococcal disease.

1. The tendency of the trainee with minor respiratory complaints to refrain from reporting to sick call accounted for many of our untreated streptococcal cases. This is illustrated in figure 2, where the streptococcal hospitalization rate fell so precipitously during the period approaching the Christmas and New Year's leave time. Perhaps a decrease in population with a decrease in exposure rates could account for some of this decline, but the absence of a decrease in rheumatic fever and the decline in admissions before leaves actually began indicate that this was not an important factor. The decrease in hospitalization rate for streptococcal infections must be attributed largely to the reluctance of the trainee to present himself on sick call and face possible hospitalization in lieu of the holiday leave.

During the early weeks of January, an intense educational campaign was initiated to encourage the trainee to appear at sick call when even minor symptoms occurred. It is believed that as a result, many streptococcal infections were seen, diag-

nosed, and treated which would otherwise have run their natural course as mild untreated cases.

2. A second, and probably more important factor was the improper treatment of recognized streptococcal cases. This became evident from interviews with patients hospitalized with rheumatic fever. In several instances, the correct diagnosis had been made but the prescribed course of therapy was too short to prevent the nonsuppurative complications. Present evidence indicates that eradication of the infecting organism from the throat is necessary if rheumatic fever is to be prevented.[3] For the most effective eradication of the streptococcal organism, penicillin blood levels must be maintained over a 10-day period.[10] This was re-emphasized to all medical officers.

A practical therapeutic problem in the protracted treatment of streptococcal infections on a dispensary level lies in the tendency of the trainee to be governed by his symptoms. He will be told to return for additional penicillin injections or to continue taking penicillin by mouth for 10 days, but all too frequently, with the subsidence of his acute symptoms, he will discontinue therapy after 3 to 4 days. This sequence of events accounted for a considerable portion of rheumatic fever in the early part of the winter. This was eventually corrected by admitting patients with streptococcal infections to the hospital for treatment.

3. The last, and we believe the most important factor in curbing the untreated streptococcal rate, was the institution of a policy whereby all patients who fulfilled the criteria of a temperature of 100°F or above or who had purulent pharyngitis regardless of temperature were admitted to the hospital. It has been pointed out by many that if only the clinical case which presents the classical picture of streptococcal pharyngitis is treated, an alarming proportion of streptococcal disease is missed. Breese and Disney[11] stated an accuracy of diagnosis on clinical grounds of 75 per cent in both positive and negative cases when checked against bacteriologic cultures. It is our experience that this degree of accuracy can hardly be expected at an installation such as this. Ideally, a system of throat cultures for suspected cases must be instituted.

By admitting all patients who fulfilled these criteria of elevated temperatures or purulent pharyngitis, we were able to obtain throat cultures and retain those with streptococcal disease in the hospital for a course of penicillin therapy. Long-acting penicillin in large enough quantity was not available to us at that time. Had it been available, a throat culture system on outpatient status with one injection of benzathine penicillin would

have been instituted. This should be an equally effective and less expensive method of detecting and treating acute streptococcal disease.

With the limitations imposed by the lack of a single-dose penicillin treatment for streptococcal disease, the practice of hospitalization proved valuable in reducing the untreated streptococcal disease rates and in preventing many cases of rheumatic fever. However, even in our "captive population" and in spite of energetic treatment of recognized streptococcal disease, 31 cases of rheumatic fever still occurred in the postprophylaxis period. Prophylaxis of streptococcal infections thus seems to be the only practical way, at present, to reduce the incidence of rheumatic fever to a satisfactory rate.

It still remains the problem of the physician to recognize streptococcal infections so that an incipient epidemic is apparent and prophylaxis can be instituted without delay. The physician should not wait until the occurrence of many cases of rheumatic fever alerts him to the presence of a streptococcal epidemic.

SUMMARY

The problem of controlling streptococcal disease and rheumatic fever at a large military installation is not at all simple. To effect a large-scale program for adequate prevention of the nonsuppurative complications of streptococcal disease, co-operation from many sources is requisite.

It should be continually borne in mind that satisfactory eradication of the streptococcus is more a factor of the duration of medication with penicillin than of the amount administered.

Trainees should be impressed with the necessity of appearing at sick call for even minor throat and respiratory complaints.

Because of difficulty in effecting the return of the ambulatory trainee for further penicillin therapy after his symptoms have subsided, best results can be obtained by treating persons with streptococcal pharyngitis in the hospital, except that if benzathine penicillin is available, hospitalization probably is not necessary for the treatment of persons with mild infections.

By instituting minimum criteria for the hospitalization of patients with respiratory disease, many cases of streptococcal infection in our series, which would otherwise have gone unrecognized, were discovered and treated. Had a long-acting, one-injection treatment been available, much the same result as we obtained with hospitalization could have been expected

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on an outpatient basis, by taking cultures from the throats of all those who met these criteria.

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BEGINNINGS OF A THERAPEUTIC COMMUNITY

Establishing Group Meetings on a Closed Ward

FRANK L. RUNDLE, *Lieutenant, MC, USNR*
DENNIE L. BRIGGS, *Lieutenant, MSC, USN*

THAT the closed admission ward of a psychiatric service in a military hospital can be operated as a "therapeutic community" in accordance with the principles of social psychiatry developed in England,[1] has been demonstrated and reported by Wilmer.[2,3] He described his experiences in operating an acute admission ward without use of traditional suppressive and restraining measures, particularly quiet rooms and sedation. The results were impressive and the prospect of using similar methods under other circumstances was appealing. It seemed that such a method of ward management and patient treatment would be ideally suited to the operation of the closed ward in this overseas naval hospital.

Having had no experience in group therapy and lacking more detailed information than that appearing in Wilmer's article, the senior author, who was Ward Medical Officer, was reluctant to initiate such an undertaking. However, with the aid of the junior author, who was a clinical psychologist and had had such experience, the program of establishing the closed ward as a therapeutic community was begun. In this article some of the practical problems involved during the first six weeks of that program will be discussed.

INITIAL CONDITIONS

The physical arrangement of the closed ward presented great disadvantages, as it had not been originally planned as such and the facilities were far from adequate. The ward was long and narrow with a capacity, including three quiet rooms, of 33 patients. There was a small enclosed courtyard at the rear where patients could play basketball and volleyball. Patients were not allowed off the ward except in the custody of a corpsman and at the spe-

From the U. S. Naval Hospital, Yokosuka, Japan.

cific order of a medical officer. Except for playing ball and a daily movie on the ward, the only entertainment and recreation for the patients was provided by the Red Cross.

Prior to the initiation of the therapeutic community program, nurses were not regularly assigned to the closed ward. Usually the nurse on an adjacent ward covered the closed ward as well, being there only briefly to dispense medications and care for administrative details. At nights it was covered by the supervisor, who usually had six wards to cover.

The hospital corpsmen on the ward had had no formal training in the care of psychiatric patients or in the management of a psychiatric ward. All had volunteered to work on the neuropsychiatric service. Most of them were basically friendly and understanding in their dealings with patients, but there were some who were so insecure and felt so threatened that they needed to use means of physical restraint.

This is the only fully staffed naval hospital West of Guam and serves naval and Marine Corps personnel in Korea, Japan, Okinawa, Formosa, and aboard ships operating in the encompassed areas. The average monthly psychiatric admission rate is about 70 patients. Patients frequently arrive without prior consultation with our staff, hence many are admitted when consultation would suffice. Frequently brig prisoners from the surrounding activities are sent for admission for little other reason than not being able to accept their status as prisoners. Sometimes of necessity acutely intoxicated and disturbed individuals are admitted to the ward overnight because there is no other place to put them. Frequently persons involved in administrative or legal action because of homosexuality are admitted for administrative reasons. Patients who have made a suicidal gesture or attempt are unusually common due to special factors and circumstances in the Far East.

All the above factors caused the ward population to be extremely heterogeneous and often difficult to manage, and adversely affected therapeutic aims in some instances.

INITIATING THE NEW PROGRAM

The only preparations made for initiating the "new regime" as it came to be known were these: (1) The bunks on the ward were rearranged so a large enough area could be provided for the patients and staff to be seated in a circle. (2) The corpsmen were told that we were about to try something new in the way of ward management and that the objective was to abolish suppressive technics and place as much responsibility as possible for control and management upon the patient, both individually and

collectively. (3) Patients and staff were informed that a meeting would be held on the ward every morning except Sunday and that everyone would be expected to attend.

There were 26 patients on the ward when the new program began. These patients had been on the ward in some instances for only a day, and in one case for six months. Twelve patients were diagnosed as schizophrenic, 3 as having a neurotic depressive reaction, and 1 as having an anxiety reaction. The remaining 10 were classified as having character and behavior disorders.

Plan of the Day. The working day on the ward began at 0745 hours when the staff doctors and nurse interviewed newly admitted patients. Sick call followed, and the group meeting took place soon thereafter and lasted 45 minutes. A staff meeting followed the patient meeting, in which the group meeting was analyzed and pertinent information about the behavior of the patients on the preceding day was discussed. A report from the night corpsmen was made known to the staff.

The First Group Meeting. For the first meeting, the physician, the clinical psychologist, the nursing supervisor, a recently assigned ward nurse, 2 Red Cross workers, the master-at-arms, 6 hospital corpsmen, and 23 patients were gathered in a circle in the rear of the ward. Three patients absolutely refused to attend the meeting.

The meeting was opened by the Ward Medical Officer who stated that the group would meet daily six times per week for 45 minutes, and that all present were invited to use this opportunity to express their feelings about the way the ward was run, to ask questions, and to bring up any personal problems with which they desired help.

The first patient to speak was the one who had been on the ward the longest (six months) and who was tacitly recognized as the leader by most of the patients. This patient asked why the radio couldn't be located at the rear of the ward rather than at the nurses' station and why the corpsmen considered it dangerous to have it in the limited recreation area. One patient, half sarcastically and with insight into some of the staff's attitudes remarked, "We are all emotionally unstable and can't be expected to control ourselves," and then got up and nervously paced the floor for the remainder of the meeting. Another patient declared to the group that now that a nurse would be regularly assigned to the ward, the patients would have to watch their language. At another time a patient asked if a quiet hour could be observed, and after considerable discussion by the group it was decided that due to weekday activities such a quiet hour could be observed only on Sundays.

The general tone of the meeting was lively and at times several persons spoke at once. In addition, there was laughter and sarcasm, and some patients held private conversations with other patients and with staff members. The Ward Medical Officer interceded to encourage order and recognition of a single speaker. Throughout the meeting there was a display of real interest in improving ward conditions, but the revealing of personal feelings and problems was minimal.

Afterward the staff assembled in a small office on the ward and recounted the events of the meeting just held. The ward physician, psychologist, and nurses felt encouraged and optimistic, but most of the corpsmen seemed skeptical. The corpsmen later explained that they initially believed their position of authority and means of control of the patients were in jeopardy.

Subsequent Group Meetings. In the succeeding weeks, the group meetings continued to develop in the direction of open and free discussion. Initially, considerable time was spent in questioning and evaluating past restrictive measures and in some cases deciding to change them. Immediate interpersonal entanglements, both between patients and between patients and staff, were more freely aired as time passed. As the atmosphere of receptiveness and tolerance of discussion developed, more and more problems of an inner personal nature were introduced. At the end of six weeks, the period covered by this article, the group meetings were effectively utilized in working out difficulties between individuals, problems of ward management, and personal problems of considerable intensity and importance.

IMMEDIATE PROBLEMS

The following points that arose in the first six weeks of operating the closed ward as a therapeutic community are considered to be of importance for others who might be interested in starting such a program but who are lacking in experience, as was the senior author. Some of the errors made in beginning this undertaking, from the standpoint of the mechanics of running the daily groups, will be discussed.

Attendance. We did not insist initially that every patient attend the meetings, but strongly urged them to do so, stating that we expected everyone to attend. We found that attendance must be required in the operation of a community type treatment program, as the feelings and behavior of every patient and staff member influence the others. We found that those patients who refused to attend, thus not allowing their attitudes and actions to be considered and inspected by the community, were those who caused the most difficulties on the ward. We eventually realized that we had to exercise our military prerogative as officers and

require every patient to attend. We then found that those who formerly refused would attend without overt resistance. It appeared that an important part in their subsequent change in attitude was due to our providing them with an acceptable reason to save face and join the community, which apparently they had wanted to do all along.

The problem of attendance at meetings now rarely causes difficulty, but when it does come up with individual patients, it always has significance and is brought up in the meetings. Once in a while, if a patient refuses to attend, the group waits for him and the leader does not allow the meeting to proceed until all are present. The other patients will usually convince the patient that he should be there; an appeal to courtesy and good behavior is frequently all that is necessary.

Seating. The area used for the meetings should be fairly small so as to encourage patient and staff to sit close to each other and to allow each to be visible to all. This in itself fosters social control as each member of the group is under scrutiny by all others. Despite all efforts to maintain group solidarity in seating, some patients and staff tend to occupy positions indicative of their resistance or need to avoid scrutiny. Permitting persons to sit on table tops, on the floor, and behind objects allows them to remain outside the group physically as well as psychologically and to escape being members of the group. It is desirable for the staff to disperse themselves in the group to meet the immediate needs of the patients; however, it was often obvious that they placed themselves in accordance with their own needs.

If a patient is resistive or upset, a staff member may personally extend an invitation to the patient to sit by him in the meeting. Initially some of the staff did not sit, but stood in the fringes of the group. After repeated fruitless discussions in staff meetings this matter was finally resolved simply when the leader on one occasion offered a corpsman his chair. We believe that the leader should sit in the same position at each meeting but that the rest of the staff should distribute themselves throughout the group. The patients soon seem to reserve the same position for the leader and we believe it symbolically provides some bit of security upon which the insecure patient can depend. On one occasion when the leader had to be absent from the meeting, the senior corpsman carried on the meeting, sitting in the leader's chair, which resulted in the expression of good-natured indignation.

Time. Our groups met for 45 minutes 6 days per week, and we adhered to the beginning and ending times quite strictly. At

times it was thought necessary to run over the allotted time when a patient was especially distressed or a ward problem was crucial. At such times we always announced to the group that we were taking the extra time, but that we believed it was important. On one occasion we thought it necessary to hold an extra group in the afternoon, and once at midnight, as important ward problems had remained unresolved or had arisen and all the patients were disturbed. Patients tend to bring up important personal matters near the end of the hour, and rather than extend the time, we acknowledge the importance of the material and encourage them to bring it up at the beginning of the next hour and enlist the aid of the other patients to help the patient during the day if it seems indicated.

Opening Remarks. Except when a number of patients are at the group meeting for the first time, we open the group with silence and allow the patients to bring up the first material, always noting who speaks first and what is said. When new patients are present, we acknowledge them and explain briefly the purpose of the group, as a social courtesy. We early cautioned the staff to let the patients open the meetings and if the staff had material to bring up, to save it for the last 15 minutes. We later found they either misinterpreted this or used it to their advantage in not talking in the group at all and so abolished that practice. We still believe that the patients should open the discussion, but encourage the staff to participate whenever they feel inclined to do so. The meetings frequently open with prolonged silence and the staff has learned in most cases to tolerate their own tension. One group opened with 35 minutes of silence and we commented upon how unusual it was for so many people to sit together for so long without talking and that perhaps silence was helpful, for it gave them a chance to sit together and think. Sometimes we used recordings to stimulate group discussions, but this is not often required. We closed the meetings by summarizing what had been said and by making some broad general interpretations of the meaning of individual and group relationships and interactions.

Distractions. Initially distractions seemed to appear in frequencies far beyond chance and were used as excuses to not attend meetings. Telephone calls during the meetings and people being called out to attend to other matters tended to disrupt the meetings and detract from the tone of seriousness and importance which we attempt to create. When the staff did not regard the meetings important enough to attend, the patients often patterned their behavior accordingly. Consequently for 45 minutes each morning, we attempted to have all activity cease on the ward. We put forth the idea that this daily meeting was the most impor-

tant single treatment procedure for the day and required that the staff participate as a treatment team and attempt to hold possible distractions to a minimum. The group leader should never answer the telephone or leave the group meeting except in absolute emergency. He should allow no staff member or patient to leave except if unavoidable. Patients always noticed closely which staff members attended and often commented on their presence or absence both during the meetings and outside them.

Withdrawal. Except in rare instances, patients were not permitted to withdraw or leave the group. If a patient became angry and left the group we waited to see if another patient would attempt to retrieve him; if not, a staff member would try. If these means were not successful, the leader would always go after the patient, and in few instances has a patient refused to return. When he returned, the matter was discussed and the group attempted to help him control himself and his anger more adequately. In one instance, an aggressive, angry patient made a lunge for the door as a corpsman was opening it, making loud angry statements to the group. A nurse, with no prior training or experience in psychiatry, went after the patient and brought him back to the group and held his arm gently for the remainder of the meeting. Previously his scuffles had required several corpsmen to help him gain control of himself.

Aggressive Behavior. Occasionally, tempers flared and erupted and patients verbally or more rarely physically (once during this period) attacked other patients. A sharp verbal attack can usually be handled by promoting ventilation and making interpretations of obvious factors involved. Physical violence must, if necessary, be physically constrained by the staff in a matter-of-fact, nonhostile manner; then, if possible, the person's feelings should be discussed.

Relaxation of Old Restrictive Measures. A great part of the initial group discussions concerned the questioning and re-evaluation of old restrictive measures such as are practiced on most closed psychiatric wards. As much as was possible, the group was encouraged to arrive at their own decision as to whether such measures were any longer necessary. However, in some cases the medical officer found it necessary to contradict group opinion and decision concerning such matters, because of administrative necessity or because of his own philosphy of treatment. Events subsequent to the period with which this article deals demonstrated that external control measures can be safely relaxed only gradually as patient group solidarity and acceptance of responsibility for individual actions are developed. Perhaps it would be even more important that the staff feel confident and unthreatened by changing of security measures.

SUMMARY AND CONCLUSIONS

Some of the immediate problems encountered in the initial phases of establishing a therapeutic community type of management and treatment on a closed psychiatric ward in an overseas military hospital have been discussed. This article was prepared to give others who are inexperienced in methods of community therapy some idea of the more concrete problems arising in the undertaking.

The immediate goals in using the therapeutic community approach were to: (1) improve ward management by dealing openly with patient-staff tensions and resentments and the adjustment of patient-staff roles and relationships which this involved; (2) prepare patients for continued treatment and hospitalization by acculturating them to the hospital; (3) promote realistic acceptance by patients of their roles as patients; and (4) encourage patients to take an active part in their own treatment and that of other patients. These goals have been attained in general.

Through the therapeutic community method, the number of acute management problems occurring on the ward has been greatly reduced, and except for occasional use of the quiet rooms for acutely disturbed drunk patients, the need for restraint has been entirely eliminated. Informal communications received from other hospitals to which some of our patients have been evacuated indicate that many of them take their hospitalization more seriously and work harder in their treatment than do patients from most hospitals. In some instances, they reportedly assisted the other patients in learning to accept their status. Long-range plans for using this method of treatment at this hospital include development of procedures for returning more patients to duty from this command and improving the condition of those who require evacuation to the United States for further treatment.

It is possible by applying therapeutic community technics to materially improve the over-all quality of patient care, particularly as regards socio-environmental aspects of treatment, on the psychiatric service in a military hospital not designated a "treatment center." It appears that continued use of traditional suppressive management because of inadequate facilities, lack of trained staff, and rapid turnover of patients is not justifiable, considering that all these disadvantages were initially present in this case and did not prevent the successful use of the therapeutic community method. Of primary importance in an undertaking such as described herein is that the staff have a sincere interest in and a genuine desire to help people. Specialized technical training is not essential, although provisions for training ward personnel within the program are important. Absolutely

essential is a general attitude on the part of the staff which embodies kindness, understanding, sincerity, and an unfailing conviction of the worth and dignity of the human being.

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PSYCHOLOGY OF HIGHWAY SAFETY

"Understanding and possibly controlling the human factors of drivers (e. g., their attitudes and personal adjustments) as well as the driver's equipment and environment (e. g., the design of his automobile) provide the most promising areas to prevent automobile accidents. Though no single characteristic of drivers has yet been isolated that appears to be outstanding in accounting for the large proportion of accidents on the highways, there do appear to be several etiological groupings. One of these is the accident repeater, who may manifest general instability in society, or even possess a mild psychopathic personality. As in the control of other epidemics, we must find means of identifying the most important variables relating to the "host," as well as the "agent" and the environment. Physicians can play an important role in such an approach."

—ROSS A. McFARLAND, Ph. D.
in *Journal of American Medical Association*
p. 233, Jan. 26, 1957

NONSPECIFIC PROSTATOURETHRITIS

ARTHUR N. TESSLER, *Lieutenant, MC, USNR*
JESSE F. RICHARDSON, *Captain, MC, USN*

NONGONOCOCCAL urethritis is the term used in recent literature to describe the presence of a urethral discharge not associated with intracellular diplococci of gonorrhea.

It has also been called nonspecific, or less commonly, nonvenereal urethritis. Its etiology, pathogenesis, and pathology is but partially understood.

The discharge is most frequently mucopurulent or milky, but varies from frankly purulent to mucoid. It varies from profuse to scant and usually is associated with dysuria of varying degrees, particularly in or near the urethral meatus. Less frequently the patients complain of frequency, urgency, and pain in the perineum. Microscopic examination of the discharge reveals pus cells and bacteria, usually gram-positive,[1] in various concentrations.

Treatment of this condition is empirical and clinical relapses have plagued all military medical officers. There are many reasons for delay in better understanding of this misnamed disease, but some of them can be overcome. We wish to relate our experiences with this disorder, suggest improvements in therapy, and to suggest new methods of study.

INCIDENCE

It is impossible to report the accurate incidence of this disease because it is not a reportable disease in most areas. Only since 1952 has it been a reportable disease in the United States Navy. During the years 1953 to 1955 approximately 20,000 cases have been reported annually in the Navy and Marine Corps.[2] This represents approximately 2 per cent of the men in these services. Interpolated for the remaining services the resultant figure re-emphasizes the magnitude of the problem for this nonserious "entity."

From the number of articles on the subject originating within the medical departments of the armed services, compared with the scarcity of both articles, and apparently cases, from our

From U. S. Naval Hospital, St. Albans, Long Island, N. Y. Dr. Tessler is now at 4 Bayside Drive, Great Neck, N. Y.

civilian population, we must infer that something inherent in military life is important in the etiology of this disease. Two thirds of the cases reported in the Navy and Marine Corps[2] were personnel assigned to ships, 28 per cent were men stationed in noncontinental United States stations, and 7 per cent were men in the continental United States. The incidence among shipboard personnel was from 3 to 4 per cent; among personnel at overseas stations, 4 per cent; and among men in the States, the incidence was 0.3 per cent. The incidence varies geographically, but it is so universal as to rule out a "vector of limited geographical habitat."

ETIOLOGY AND PATHOGENESIS

One cannot fail to be impressed with the concept of venereal transmission of nonspecific prostatourethritis. Whenever a new group of servicemen arrives in an endemic area, new cases occur. Almost invariably, those afflicted have had sexual intercourse, without the use of a mechanical prophylaxis, some 10 days to 3 or more weeks prior to the onset of symptoms. Although some authors hesitate to accept the venereal concept, none has expressed any doubt as to the infectious origin of the disease. Numerous organisms have thus far been incriminated—staphylococci,[3] diphtheroids, pleuropneumonia-like organisms[4] and others, but no causal relationship to any has thus far been established.[5,6]

The absence of a predominating organism that can be cultured and retransmit the disease does not rule out a bacterial origin, but does suggest a nonbacterial origin, and a need for new culture and staining technics. Penicillin prophylaxis has been implicated as a possible causative factor because of the rise in incidence of nongonococcal urethritis concomitant with its use. A more realistic reappraisal, however, centers attention upon the sexual indiscretion of servicemen receiving such prophylaxis. The role of alcoholism has also been discussed. It has long been known that imbibed alcohol is partially excreted in the urine and acts as an irritant, particularly in an already inflamed bladder or urethra. This is the reason for restricting its use during convalescence. Drinking is often associated with sexual exposure.

PATHOLOGY

It is difficult to study the morbid anatomy of nonfatal diseases and one must depend upon "fortuitous" circumstances for specimens because biopsy is not indicated except under controlled research. However, one can easily observe the injection of the terminal urethra directly and the remaining urethra with panendoscopy. The frequent bogginess and tenderness of the prostate is palpable and the changes in prostatic secretions observable with the laboratory microscope. The frequency of prostatic in-

volvement has been reported as 73 per cent by Ambrose and Taylor.[1] Our experience has been similar to theirs. For this reason we agree with Wolf and associates[7] who suggested that this disease is a prostatourethritis.

THERAPY

At present therapy is empirical. Most widely employed is a combination of antimicrobial agents, dietary restrictions of alcoholic beverages, condiments, and caffeine-containing drinks, and often sexual restrictions. When prostatic involvement is recognized massage of the prostate is employed. We concur with the use of antimicrobials, dietary restrictions, and massage, but not with complete restriction of sexual activity. During the acute phase of disease, fear and anger usually restrain the patient from sexual activity, and it is only during the acute inflammatory phase that such restrictions are indicated. It is unrealistic, even with the "Simon Pure" to avoid sexual stimulation, and certainly the group afflicted is not Simon Pure. The resulting prostatovesicular engorgement adds to prostatic disturbances that are manageable by massage but are more completely relieved by natural means. Patients with chronic prostatic inflammation and obstruction of the prostatic acini, if married, should be encouraged to have a natural and active sexual life.

Although we employ antimicrobial agents, we know of no study of the natural history of the disease in a large series of patients. Ambrose and Taylor, in their small series of 41 cases, found that 3 patients recovered spontaneously without therapy and 3 patients had persistant discharge despite Terramycin (brand of oxytetracycline hydrochloride) therapy. Eight patients who were given placebo for six days had no demonstrable improvement; they recovered promptly after receiving Terramycin. At this hospital we have been impressed recently with the usefulness of nitrofurans as well as the tetracyclines. In a small series we have employed Furadantin (brand of nitrofurantoin) orally and Furacin (brand of nitrofurazone) as a urethral suppository with satisfactory response.

We believe that studies to evaluate various agents and to elucidate the natural history of the disease are in order. At this hospital we see few early cases, but we do eventually see almost all of the "refractory" cases in the Third Naval District, from all three branches of the service. Inasmuch as new cases are generally seen first at base dispensaries and aboard ship we suggest that a study at that level would be most fruitful. Opportunity for follow-up is also greatest at that level.

Our study of "refractory" cases has revealed misdiagnosis as the most common cause of therapeutic failure. The three most commonly misdiagnosed entities referred to us have been:

1. Unrecognized urethral strictures. These are usually congenital and are commonly at the meatus, and are easily observable but frequently not looked for. Congenital stricture at the level of the corona are common and strictures elsewhere secondary to previous infection, although fewer in number than in former years, are not rare. While the original diagnosis of nongonococcal urethritis may have been correct, cure, as with infections elsewhere, will not be accomplished until the obstruction has been relieved. For this reason all refractory cases should have the urethra calibrated and strictures discovered or ruled out.

2. Traumatic urethritis, resulting from "milking down" the urethra both to see and rid oneself of infection.

3. Venereal neuroses and guilt reactions without actual disease. The relationship of this entity to the second is evident.

Less commonly, misdiagnoses associated with the urethral discharge or other related symptomatology have been (1) urethral polyps, (2) trichomonas infections,[8] (3) cancerophobia and other neuroses. Treatment for each of these entities is available and usually satisfactory.

Our opportunity for follow-up is limited and statistical study is difficult because we treat a large number of men afloat and from outlying posts. We assume that a patient has been cured after therapy if he is not returned to us by a physician aboard the ship or at an outlying post who is at the same time referring to us patients with recently discovered prostatourethritis. We are certain a more careful study of so-called refractory cases will reduce the incidence now estimated at 8 per cent to much lower levels.

SUMMARY

Nonspecific prostatourethritis is a disease of unknown etiology. At present, it appears that it is infectious in origin and may be transmitted venereally, but no specific causative organism has been isolated.

Judging from the literature, the incidence is higher among the military than among the civilian population.

The therapy with which we have had the most success has included use of antimicrobial agents, prostatic massage when there is involvement of the prostate, and restriction of alcoholic beverages, condiments, and caffeine. In addition to the tetracyclines we have had satisfactory responses from using Furadantin (brand of nitrofurantoin) orally and Furacin (brand of nitrofurazone) as a urethral suppository.

The incidence of "refractoriness" will be greatly reduced if urethral strictures, traumatic urethritis, venereal neuroses, urethral polyps, trichomonas infections, and cancerophobia

and other neuroses are not misdiagnosed as being nonspecific prostatourethritis.

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ANTIBIOTICS MAY BE TOXIC

Sometimes, let us admit, the doctor is in a panic "to do something" for a patient who has a fever, while the cause of the disease has not been determined. This often results in the institution of a completely irrational regimen of antibacterial therapy. All of us should remember *that any antibacterial agent may be a poison for some patients* and hence use thought, care, and discrimination in the use of sulfonamides and antibiotics. If we do this, the incidence of the harmful effects of antibiotics will be lessened and the treatment of the patient and his infectious disease will be greatly improved.

—PERRIN H. LONG, M. D.
in *Journal of Medical Society of New Jersey*,
pp. 439-440, Oct. 1954

FRACTURES OF THE FEMORAL SHAFT

RICHARD M. CRONIN, *Captain, USAF (MC)*
DAVID SILVER, *Captain, USAF (MC)*

THE increase in number of automobile accidents in the last decade, making fractures of the shaft of the femur more prevalent, and the possibility of mass casualties in this atomic age make it absolutely necessary that fractures of the femoral shaft be treated by the method which has the fewest complications and the best results. Reducing the period of disability is of particular importance to the military.

In an attempt to determine the ideal method of treatment, a study of femoral shaft fractures in regard to type of treatment, complications, and results was undertaken. The methods studied included intramedullary fixation, which has become rather widely accepted.[1-5] It must be utilized under the proper circumstances and has many pitfalls and complications, but some of these can be avoided.

METHODS

One hundred and two patients with 106 fractures of the femoral shaft were either treated directly by us or were studied from case records. All of these patients were treated in United States Air Force Hospitals.

Our average follow-up of patients treated by intramedullary nails was 1.7 years with a range from 2 weeks to 6 years. The average for those treated by skeletal traction suspension was 1.85 years with a range from 4 months to 5 years.

There were 95 males and 7 females. All patients were members of the armed services except two, who were female dependents. Their ages ranged from 16 to 70 years, averaging 23.4 years. Table 1 lists the causes, and table 2 the types and locations of the fractures.

These patients were treated by many different orthopedic surgeons, who used a variety of methods that have been described previously.[6-8] Forty-seven of the patients had early intramedullary nailing and 17 had nailing plus autogenous iliac bone graft. There were 8 patients who had an open reduction with application

From U. S. Air Force Hospital, Chanute Air Force Base, Ill.

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of a metallic plate and screws. Skeletal traction was used in 25 cases, while manipulation and plaster immobilization in a hip spica cast was performed in 4. Russell skin traction was used in 1 case.

TABLE 1. *Causes of fractures*

Cause	Fractures	
	Number	Per cent
Motor vehicle accident	90	84.9
Fall (ambulatory)	9	8.5
Plane crash	5	4.7
Fall from horse	2	1.9
Total	106	100

TABLE 2. *Types and locations of fractures*

Location	Types				Total
	Closed		Open		
	Comminuted	Transverse and oblique	Comminuted	Transverse and oblique	
Junction upper and middle thirds	13	8	1	-	22
Middle third	34	17	6	4	61
Junction middle and lower thirds	8	12	2	1	23
Total	55	37	9	5	106

RESULTS

Intramedullary Nailing

Open medullary fixation will result in at least two groups of complications: (1) Those that are related to the nail itself, and (2) those that may develop as a result of an open reduction. Among the 64 patients in this series who had intramedullary nail fixation, 2 had broken nails. In 1 case a new nail had to be inserted. This patient stated that since removal of the distal half of the nail through his knee he has had pain. In the other patient, only the proximal half of the nail could be removed.

Another complication in 1 patient was the migration of the nail proximally, with resultant hip pain, until it was advanced by means of a second operation. The nail could not be removed in 1 instance but fortunately was not causing any difficulty.

Hip pain seemed to be a somewhat frequent complaint and was noted in 29 per cent of those with intramedullary nail fixation. It was usually caused by bursitis and inflammation in the region of the proximal tip of the extruding nail. Often the bursa would become calcified, leading to increased pain. The pain was noticed particularly after the patient had been sitting for varying periods of time.

In this series there were no complications as a result of the length or diameter of the nail, such as sometimes occurs.[9, 10] There were no instances of the nail cutting out or splitting the femoral shaft. The problem of a nail being stuck at the isthmus of the femoral shaft was not encountered. Fat emboli and surgical shock were not encountered in this series. Two patients developed cardiac arrest; one responded to cardiac massage and the other died. Cardiac arrest took place before the incision was made in one of these patients. Two instances of osteomyelitis were recorded, one of which was in the shaft in a closed, comminuted fracture and the other at the site of an iliac bone graft. There were two cases of pulmonary embolism and one each of phlebothrombosis and thrombophlebitis. None of these four were fatal. One patient developed a nonunion because the intramedullary nail had migrated proximally. There were two cases of malunion. One occurred because the nail had bent, resulting in an anterior and lateral bowing of the shaft. In the other, an external rotation deformity below the fracture site required a later osteotomy.

Shortening was present in 19 per cent of those treated by intramedullary nailing. Eighteen per cent stated that they either had pain of some degree or some loss of motion in the knee.

Skeletal Traction

In the 25 patients treated with skeletal traction and suspension, there were 5 instances of malunion and 1 of nonunion. The pin tract in the tibia became infected in 1 patient with a resultant osteomyelitis. One patient developed a thrombophlebitis and another cystitis with calculus formation in the ureter. Forty-eight per cent claimed to have some difficulty with their knee, either pain or loss of motion, while 60 per cent had some degree of shortening. Table 3 compares the incidence of certain complications in patients treated with intramedullary nailing with that of patients treated with skeletal traction.

TABLE 3. *Comparison of incidence of complications in intramedullary nailing with the incidence in skeletal traction*

Complication	Method of treating fracture	
	Intramedullary nail (per cent)	Skeletal traction (per cent)
Bone		
Malunion	3.1	20
Nonunion	1.6	4
Refracture	1.6	8
Shortening	19	60
Osteomyelitis of tibial pin tract	-	4
Joint		
Pain or loss of motion in:		
knee	18	48
hip	29	28
Prolonged bed rest		
Thrombophlebitis	3.1	-
Pulmonary embolism	3.1	-
Cystitis and ureteral calculus	-	4

Open Reduction and Fixation With Metallic Plate and Screws

Complications in the eight patients treated with this method included one instance each of osteomyelitis, a broken plate with refracture, and delayed union. One patient had a tremendous blood loss following surgical procedure that required a transfusion of 5,000 ml of blood.

Manipulation and Plaster Immobilization

Any analysis of this method might be misleading, for there were only four patients in the group. These four tended to have difficulty regaining knee motion, and three of them had some shortening.

Complications of the Fracture Itself

There were two supracondylar amputations in our series. Both of these were a result of direct vascular injury to the femoral artery. One was a closed, comminuted, middle-third fracture, while the other was an open, comminuted fracture at the junction of the middle and distal thirds. In one patient the artery was lacerated in the adductor canal, while in the other it was lacerated in the popliteal area just after leaving the canal.

Return To Duty

In the military service a patient is not returned to duty until he is capable of performing his job. Thus, the hospitalization

is normally longer than in civilian life where the patient can convalesce at home before returning to work. We found that the average time for 102 patients before returning to full military duty, using all methods of treatment, was 4.7 months. The time for the patients with intramedullary nails was 3.2 months, with a range from 1 to 7 months. The average time for skeletal traction suspension method was 6.9 months, with a range of from 3 to 15 months. The number of patients treated with the other methods was too small to analyze, but none of them returned to duty as early as the group treated with intramedullary nails.

COMMENTS

Fractures of the femur are very serious injuries, and the results of the treatment often leave much to be desired. Many of the complications that result from nailing can be overcome if proper conditions are satisfied. First, the fracture must be in the middle three-fifths of the shaft. Secondly, the patient should be an adult in good general condition. Inasmuch as a fracture of the shaft of the femur requires a tremendous force, other associated injuries are often present. We found a rather high incidence of associated cerebral concussions. It is mandatory to wait until there are absolutely no contraindications to surgical intervention. Shock and blood loss should be vigorously treated before the patient is operated on. A patient with a femoral fracture treated by intramedullary nail fixation who suffers severe shock on the operating table obviously would have been better treated by skeletal traction. The nailing of open fractures should be postponed until the skin has healed and there is no evidence of infection. An osteomyelitis of the femur is a discouraging complication. There was only one case of osteomyelitis of the femur and one of the iliac crest in this series. It is absolutely necessary that the nailing be performed by a skilled bone surgeon. There should be adequate assistance, supervision, good instruments, and most favorable operating room facilities.

If the above conditions are fulfilled, intramedullary nailing of the fractured femoral shaft seems to be the best method of treatment. One of the most significant advantages is that less time elapes before return to duty. In our series, the patients treated with intramedullary nailing returned to duty almost four months sooner than those treated with the skeletal traction and suspension method.

Brav and Jeffress[11, 12] thoroughly reviewed the healing time of these fractures and found it to average 16 weeks. Patients treated with the traction and suspension method did not heal any faster in our series. It is important to remember that the patient treated by nailing may be ambulatory while his fracture is healing.[13-16]

SUMMARY

From a statistical study of 106 fractures of the femoral shaft, it was found that patients returned to duty 3.7 months sooner with intramedullary nail fixation than with the skeletal-traction-suspension method. Intramedullary fixation offered the best method of treatment of these fractures.

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ELECTROMYOGRAPHY

Value in a Military Hospital

BENJAMIN L. CRUE, Jr., *Lieutenant Commander, MC, USN*

THE CLINICAL value of electromyography, using a cathode ray oscilloscope with adequate shielding and with needle electrodes, has already been adequately documented.[1-5] In recent years, this technic has been increasingly used in certain sections of this country by physicians, the majority of whom are specialists in the field of physical medicine. During the year 1955-1956, the author carried out 186 electromyographic examinations at this hospital. Inasmuch as the average time required for each examination was about 20 minutes, this represented over 60 hours spent in 1 year doing this one type of diagnostic test while at the same time running a busy neurosurgical ward. This study was made to determine whether such an expenditure of time and effort was justified.

METHOD

Electromyographic examinations were performed, when indicated, both on outpatients in the neurosurgical clinic and on inpatients. Some patients were referred from the neurologic and orthopedic services especially for this test. Inasmuch as there was little teaching involved and little reason to believe that many of the cases would come to litigation, photographic tracings and magnetic tape recordings were seldom made. Instead, the results were reported directly.

RESULTS

Of the 186 electromyograms performed,* 125 (67 per cent) were positive and only 61 (33 per cent) were negative. Of these 125 positive electromyograms, 66 were caused by lumbar "disks," 7 by cervical disks, 29 by peripheral nerve injuries, and 23 by such interesting diseases as Friedreich's ataxia (Roussy-Lévy syndrome), syringomyelia, myasthenia, cord tumor (neurofibroma),

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Presented at the meeting of the American Association of Electromyography and Electrodiagnosis, Atlantic City, N. J., 9 September 1956.

From U. S. Naval Hospital, Chelsea, Mass.

*These examinations were made with the Meditron electromyograph, model 201A (fig. 1).

progressive spinal muscular atrophy (including amyotrophic lateral sclerosis), multiple sclerosis, myotonia, poliomyelitis, and several cases of lower motor neuron neuritis of unknown cause (Guillain-Barre syndrome).

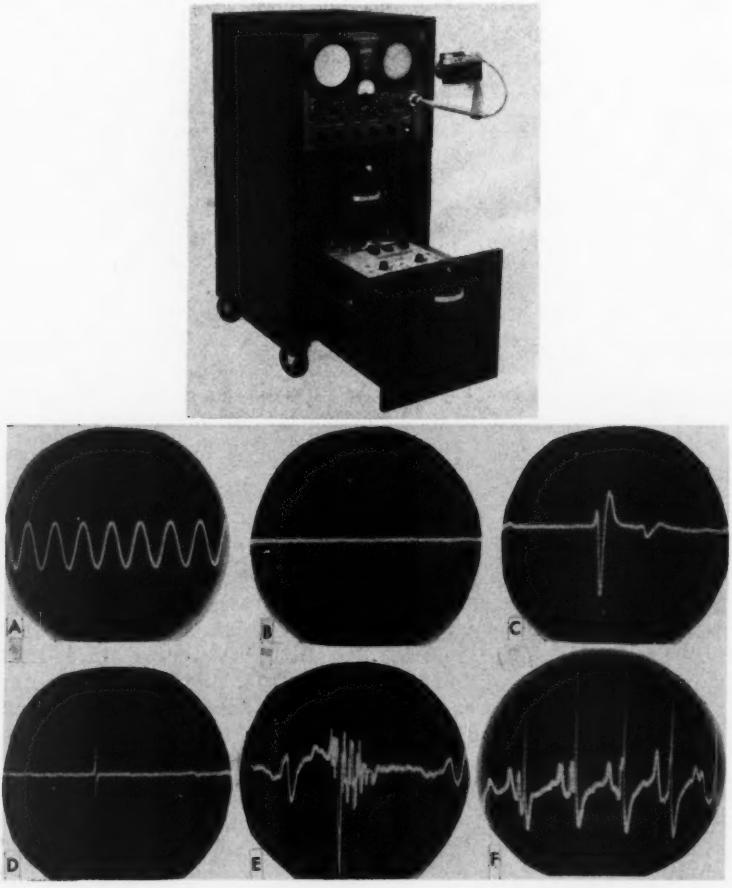

Figure 1. The Meditron electromyograph and sample tracings. (A) *Calibration, 60-cycle voltage, 200 microvolts per inch sensitivity.* (B) *Electromyographic silence of normal muscle.* (C) *Normal motor unit voltage, voluntary.* (D) *Denervation fibrillation voltage, involuntary.* (E) *Complex (polyphasic) motor unit, voluntary.* (F) *Myotonia. (Pictures and captions adapted from Meditron chart.)*

An effort was made to compare the diagnostic accuracy of electromyography to myelography in the lumbar disk syndrome. In a previous series of 136 consecutive cases of proven L4-L5

and L5-S1 disks, the myelogram was found to be slightly superior in detecting a L4-L5 disk, while the electromyogram was more accurate with a L5-S1 disk. Only one error in preoperative localization was made—an accuracy of 99.4 per cent.[4] (Electromyograms performed by Dr. James Golseth.)

In the present series there were 31 patients on whom both electromyograms and myelograms were done and who were proved by laminectomy to have herniated disks (table 1). In these 31 cases where the accuracy of localization could be compared, the myelogram was the most accurate (81 per cent), the electromyogram next (74 per cent), and clinical localization last (68 per cent). The clinical localization of the herniated disk was based on motor (S1 root, decreased ankle jerk; L5 root, weakness of dorsiflexion of foot) and sensory signs (S1 root, lateral foot; L5 root, dorsum of foot). Clinical signs are thus root signs and subject to the same error of interpretation of level as the electromyogram. Thus, a midline L4-L5 disk affecting the S1 root would be interpreted as an L5-S1 disk both clinically and by the electromyogram. Every leniency was allowed in considering a myelogram as being indicative of a herniated disk. Several of the positive myelograms were small asymmetries "consistent with but not diagnostic of a herniated disk."

TABLE 1. *Comparison between accuracy of clinical judgment, electromyogram, and myelogram in locating herniated "disks" in 31 patients*

Location of "disk" at operation	Number of patients	Results			
		All three methods correct	Erroneous results*		
			Clinically	Electromyogram	Myelogram
L3-L4	1	1	0	0	0
L4-L5	9	4	2	3	3
L5-S1	19	9	5	3	2
L4-L5 + L5-S1	2	0	2	1	0
Total	31	14	9	7	5

*In only 3 patients was more than one test either negative or in error.

It should be noted that although a definite indication of a defect on myelography, if it fitted the clinical picture, usually resulted in laminectomy, there were a number of patients with a less severe clinical syndrome who had minimal electromyographic findings of root compression, and did not have a laminectomy.

There were 21 errors out of 93 possible chances (3 tests on each of the 31 patients). In only 2 patients was there an error in preoperative localization of the lesion when all three factors were evaluated. One was the previously mentioned midline L4-L5 disk giving both the clinical and electromyogram picture of an S1-root lesion. This was interpreted as a probable L5-S1 disk, and myelography failed to disclose the error, as there was a congenitally anomalous dural sac ending at the L5 level. The second case in error was a patient who had had two previous laminectomies. Clinically, only an unstable back was diagnosed, and the electromyogram was negative. Myelography was compatible only with postoperative scarring, but on routine exploration before a spinal fusion, a recurrent L4-L5 extrusion was found.

Peripheral Nerve Injuries

Even in peacetime, a military hospital still receives a large number of patients with peripheral nerve injuries of a wide variety. Included in this series were ulnar nerve lesions from elbow trauma and from lacerations of the wrist, radial nerve lesions from Saturday-night paralysis and from fractures of the humerus, median nerve injuries incurred in automobile accidents, and several brachial plexus injuries caused by severe trauma. There were several cases of partial paraplegia following fracture of the spine at the caudal level, where electromyography helped in ascertaining the root injury level. One boy had fractures of all the transverse processes in the lumbar area on one side. He had no abnormality of the lower motor neuron of the anterior primary division, but apparently there was almost complete denervation of the posterior primary divisions in the lumbar area. There were sciatic nerve injuries and several peroneal injuries producing foot drop, some of which were difficult to distinguish from lumbar disk injuries or poliomyelitis. The value of electromyography in following the regeneration of peripheral nerve injuries is well known and will not be discussed in detail here. There were two cases, however, where the diagnosis of a nerve injury in continuity could be made and unnecessary operations prevented even though there was no grossly visible movement, because the electromyogram showed the presence of functioning voluntary motor units. Both patients recovered on conservative management.

CASE REPORTS

There were several unusual cases that show the value of electromyography.

Case 1. A 41-year-old sailor had been admitted complaining of weakness of dorsiflexion of the left foot and minimal back pain. The dif-

ferential diagnosis was between a lumbar "disk" and so-called subclinical poliomyelitis. He had repeated myelograms, which failed to reveal any lesion. The L4-L5 disk appeared normal at laminectomy, but the L5-S1 disk bulged slightly and was removed. Postoperatively, the patient did only fairly well. He returned to duty, but some months later had a recurrence of back and severe left sciatic pain and was returned to the hospital. On this occasion, electromyography was available and showed almost 100 per cent involvement in the distribution of the L5 root, with no involvement of the other roots. A repeat myelogram was again negative. After much discussion a diskogram was performed (fig. 2). This revealed a marked degeneration in the L4-L5 interspace with lateral and anterior flow of dye. A repeat laminectomy was done with removal of a minimally bulging L4-L5 disk, followed by spinal fusion. Postoperatively, the patient was free of back as well as leg pain. In this case, had it not been for objective electromyographic evidence of discrete L5 root abnormality, I feel certain that the patient would not have had a diskogram and would have continued to have considerable pain from his degenerative L4-L5 disk syndrome.

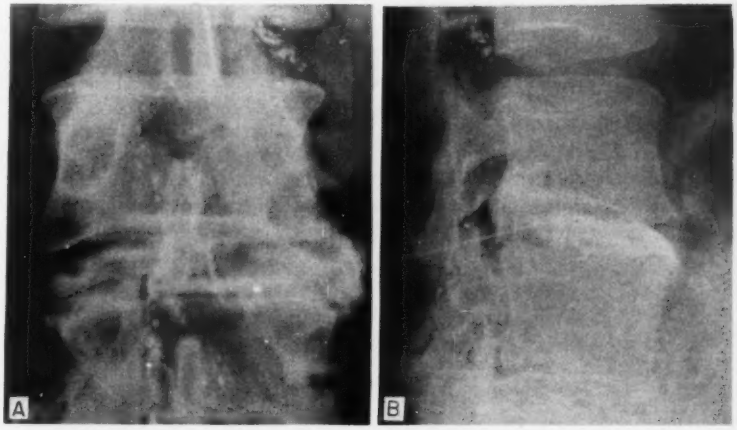

Figure 2. Diskogram of L4-L5 disk. (A) *Anteroposterior view.* (B) *Lateral view. Residual Pantopaque from previous myelograms may be seen within the spinal canal.*

Case 2. Another particularly satisfactory result was seen in a young midshipman who was home on leave in Boston during a poliomyelitis epidemic. His girl friend developed classical poliomyelitis with weakness in her right lower extremity. Four days later the midshipman developed weakness in his right lower extremity and generalized malaise, without any history of fever. About a week after the onset of this weakness the patient was referred with the impression that he had a conversion reaction. His spinal fluid contained only a few lympho-

cytes. An electromyogram showed no abnormalities, but it was my impression that this probably was a case of poliomyelitis. The patient was admitted to the hospital and placed on bed rest. During the third week after the onset of weakness, he developed definite denervation fibrillation in the already recovering right lower extremity. He made a prompt clinical recovery and returned to his class at the Academy.

Cases 3 and 4. Two patients were suspected clinically of having a herniated nucleus pulposus in the lumbar region and were referred for possible myelography. The electromyogram showed widespread lower motor neuron disease. Both patients subsequently were shown to have an infectious neuronitis.[6]

Case 5. Another unusual case was encountered when a young sailor was referred with the diagnosis of a left sixth cranial nerve lesion. He was scheduled for a "squint" operation on his left external rectus muscle. The ophthalmologist demonstrated that he could not follow laterally beyond the midline with his left eye. An electromyogram of his left lateral rectus was entirely negative, showing no denervation fibrillation when the muscle was inhibited by having him look to the right. This was a disappointment to the examiner as well as the ophthalmologist. It was interpreted as a failure of technic. Only later was it discovered that the patient must have had a very unusual unilateral supranuclear lesion. While he could not follow objects laterally with his left eye, he could externally rotate his left orbit to command!

Case 6. There is still much to be learned about the clinical use of this diagnostic tool in various pathologic conditions. Multiple sclerosis is usually considered a disease affecting primarily the white matter of the central nervous system. However, the nerve roots may show pathologic change. Electromyography on several patients with multiple sclerosis who had weakness in the lower extremities revealed only uncontrollable bursts of voluntary motor units characteristic of upper motor neuron disease but no evidence of lower motor neuron disease. However, in a recent case, which has now progressed so that we are relatively certain of the clinical diagnosis of multiple sclerosis, the patient had in her lower extremities widespread complex motor units of a very marked degree without any real denervation fibrillation of fasciculation. This is possibly an example of the concept of demyelinization without Wallerian degeneration. Whether one can interpret this type of finding in a demyelinizing disease such as multiple sclerosis remains to be proved.

DISCUSSION

Technic of Examination

The electromyographic examination should be carried out by a physician who is familar with the technic, who has some knowledge of the neuroanatomy and the suspected neurologic syn-

drome involved, and who has at hand at least a brief history of the individual patient's problem.

It is not believed that a technician or medical corpsman could be trained to do this type of examination adequately by himself, although under proper supervision such trained personnel would be of great assistance.

Performing electromyography on one's own patients has at least three advantages. First, there is the ability to choose which patients should be so examined. Second, there is an excellent opportunity in many cases to obtain prompt follow-up correlations. For example, an electromyogram and a myelogram are often done one day, and a laminectomy is performed the following morning. Third, the examiner knows exactly what is wanted and can shorten the procedure, yet include pertinent parts of the examination. For example, if I know from taking a history and doing a physical examination, that a patient has low-back pain with definite sciatic radiation and weakness of dorsiflexion of the great toe, all I want to know from the electromyogram is whether there is any denervation fibrillation in the distribution of the L5 nerve root as compared to the area supplied by the L4 and S1 roots. Consequently, only three muscles are tested: the quadriceps (L2-3-4), the anterior tibial (L4-L5), and the gastrocnemius (S1-2). The hamstrings, the gluteus, or the posterior primary divisions would not be tested.

The report in the record is mainly for my own evaluation and I usually need not worry whether another physician can interpret the recorded findings. While this type of examination destroys the strictly scientific objectivity of the test, the time saved is considerable and permits an over-all average of about 20 minutes per examination. It further saves the patient needless needle punctures and allows a more thorough search to be made in the area of a clinically suspected abnormality. Of course, this abbreviated type of examination can only be used in certain selected cases.

Military vs. Civilian Use

One difference between neurosurgical practice in a military hospital as compared to a large civilian neurosurgical center is the relatively larger preponderance of low-back disorders and cases of peripheral nerve injury found in the service, even in peacetime. This should be reflected in a larger percentage of military neurosurgical patients who would be candidates for an electromyographic examination. In this series, however, electromyograms frequently were not done on patients with obvious peripheral nerve lesions, nor were they done on all patients with back disorders. This was only because of lack of time and be-

cause no other physician trained in electromyography was available.

An example of the difference in the type of patients examined is shown in the percentage of positive electromyograms. Of the 186 electromyograms performed, 125 (67 per cent) were positive and only 61 (33 per cent) were negative. In a civilian electrodiagnostic clinic, where patients are referred for various reasons by many different doctors, negative examinations are in the majority. Such a large percentage of positive electromyograms did not result from my eagerness to find denervation fibrillation. It was produced by selectively choosing the patients on whom electromyography was done.

Although there may be a significant number of false negatives in electromyography, one of the advantages of the test is that there should be no false positives, although there may be incorrect interpretation of the findings. In all suspected root compression syndromes, a positive record is not reported unless denervation fibrillation (fig. 1) is definitely present. The large majority of patients who are examined for low-back disorders are from the neurosurgical service. A certain number of these patients, however, are referred from the neurologic, orthopedic, and even from the psychiatric services, where a negative electromyogram is expected but is desired as part of the clinical study.

One of the main values of electromyography is in the detection of early minimal root compression. This is not as true in military medicine as in civilian practice where disability litigation may be involved. Although the military patient either has to be fit for duty or remain hospitalized until disposition is made, negative evidence, as for an industrial compensation board, need not be gathered.

Each patient with a low-back disorder was judged clinically as to whether or not he had herniated disk. Patients with mechanical disorders of the back were transferred to the orthopedic service. A patient was referred for either electromyography or myelography only if he was suspected of having a "disk" and was having enough pain so that, if the electromyogram and the myelogram were positive, laminectomy would follow. There was not time to do electromyograms on those patients who had minimal complaints and who would not have been advised to have an operation even if the electromyogram did lend further substantiation to the clinical diagnosis of minimal root compression. These patients were all treated conservatively and a large majority of them returned to duty without having either an electromyogram

or a myelogram. In a number of cases in which the diagnosis was questionable, an electromyogram was done even though the complaints might have been minimal. These patients made up a large share of the negative reports.

Comparison of Electromyogram With Myelogram

In the comparison of electromyogram to myelogram, the relative value is not shown in its true aspect. The 7 electromyographic errors included 2 where the test was done before the necessary 3 weeks had elapsed since root compression. This error was kept to a minimum by usually not doing electromyograms on patients without a history of at least 21 days of sciatic pain. One other case was an error in localization where an L4-L5 midline disk affecting the S1 root had been interpreted as an L5-S1 disk. The other 4 errors were in missed diagnoses; that is, the electromyogram was negative although a definite herniation was found at operation. The nerve roots unfortunately were not stimulated to see whether there had been damage to the conductivity of the motor efferent fibers. It is thought that it is possible to have a disk protrusion doing enough damage to the roots to cause considerable pain (and give a large myelographic defect) without much motor damage, resulting in a normal electromyogram. However, in 2 of the 4 cases with normal electromyograms there had been nerve root damage of long standing with considerable atrophy, weakness, and reflex change. A normal electromyogram in this situation is not completely understandable unless the author's method of trying to sample 40 different areas in each muscle tested is not statistically adequate. Basically, however, electromyography is of comparable accuracy to myelography for diagnosing herniated lumbar disks. It is certainly an easier preliminary screening test and there was at least 1 case in the 31 where the patient would not have had a myelogram or an operation had the electromyogram not been found to be positive. It was believed that the patient had a functional, stocking anesthesia, but after repeated returns to the clinic an electromyogram was done in desperation and to our surprise showed considerable fibrillation in the distribution of the S1 root. I feel certain that in this case much additional time would have elapsed before any neurosurgeon would have contemplated performing a myelogram on the patient, in view of her particular history and complaints.

SUMMARY AND CONCLUSIONS

During the year 1955-1956, 186 electromyographic examinations were carried out on the neurosurgical service of this hospital. Of these, 125 (67 per cent) were positive.

In a series of 31 consecutive cases of herniated lumbar "disk," proved by laminectomy, the electromyogram was correct in 74 per cent of the cases, the myelogram in 81 per cent. By combining the results, only 2 errors in preoperative diagnosis of location were made.

Several unusual cases in which the electromyogram was of especial help or interest are presented briefly.

The advantages of electromyographic examination of patients with whom the examiner is familiar is stressed.

It is concluded that electromyography is of definite value in a military hospital. Although the cases described in this report emphasize particularly the value of electromyography in the diagnosis of herniated intervertebral disks, it also is useful in peripheral nerve injuries and other neurologic and neurosurgical conditions.

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NONSPECIFIC EPIDIDYMITIS IN THE MILITARY SERVICE

WILLIAM M. ROSS, *Major, MC, USAR*
JAMES H. MAYNARD, *Captain, MC, USAR*

NONTUBERCULAR, nongonococcal epididymitis is far more common than textbooks would lead one to believe, and the incidence in military personnel is particularly high. Military surgeons have often observed this condition in men who are otherwise entirely well but have been forced to march or parade for long periods of time, or have been subjected to marked exertion, but who have had no instrumentation or operation. These cases occur frequently enough to account for a significant number of hospital admissions to the urologic service of the average Army hospital, and result in many duty hours lost. In 1956, Gartman[1] reported that of 189 patients with epididymitis, there were 76 acute and 14 chronic cases of which the cause was not known, although retrograde flow of urine was considered.

Numerous cases of nonspecific epididymitis have also been reported in industry. Amdur,[2] in 1943, described 14 industrial cases, most of which occurred after muscular exertion. Many of the patients admitted a full bladder at the time of strain. These cases were characterized by an absence of constitutional symptoms, urinary symptoms, or urethral discharge. Urine examination was essentially negative in all of the patients. It was suggested that the clinical picture could be explained as an irritant response to the retrograde propulsion of urine down the vas deferens.

Anatomically, this theory seems entirely plausible. The prostatic urethra is the widest portion of the urethra, its proximal end being closed by the internal sphincter and its distal end by the membranous urethra, which is the narrowest and most rigid portion of the canal. At the time of strain, urine may pass through the internal sphincter and be blocked at the external sphincter, some of the urine being forced into the ejaculatory duct and down the vas deferens. This would be most likely to happen with a full bladder.

It has been shown experimentally that urine can be made to travel in this retrograde manner.[3-5] Graves and Engel[6] injected

From U. S. Army Hospital, Fort Leonard Wood, Mo. Dr. Ross is now at 8201 South Ashland Ave., Chicago 20, Ill.

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fluid down the vas deferens in dogs, using sterile urine obtained from the animal on one side and saline on the other side for control. The saline injection did no harm, but inflammation of the epididymis developed on the side injected with urine. These investigators proposed the concept that sterile urine can find its way into the vas deferens and cause a chemical epididymitis.

Our study was undertaken to better understand the nature of acute, idiopathic epididymitis, particularly as it applies to the military. Ninety-two cases of epididymitis, of which 90 were nonspecific, were observed over a 15-month period at this hospital. A large number of this group of patients were trainees. The age range was 17 to 37, most of the patients being from 19 to 22 years of age. In each case a careful history was taken and a complete physical examination made. The following laboratory procedures were performed in each case: total and differential leukocyte counts, complete urinalysis, urine culture, and examination of a smear of the prostatic secretion.

These patients were first seen from 12 hours to 5 days after the onset of symptoms, the majority being seen within 24 to 48 hours. The onset in 32 patients was described as sudden, with severe scrotal and inguinal pain, followed in a few hours by scrotal swelling. In the remaining 60 patients the onset was slow, with symptoms reaching their height in 24 to 48 hours. Of the total number of patients, 18 (less than 20 per cent) complained of constitutional symptoms such as malaise, headache, or loss of appetite. The others did not feel nor appear ill. Twenty-one of the patients showed a temperature elevation over 99.5°F, 8 of these having a temperature of over 100°F. The highest temperature was 102°F.

Symptoms of epididymitis (table 1) appeared after physical training in 12 patients, after heavy lifting in 16, after long marches in 13, and after a long automobile ride in 2. Twenty-one of the patients reported that they felt an urgent need to urinate at the time of exertion or marching.

TABLE 1. *Symptoms of 92 patients with epididymitis*

Symptom	Number of patients
Scrotal pain	92
Scrotal swelling	92
Urinary symptoms	18
Urethral discharge	2
Fever	21
Malaise	2

Of the 92 cases studied, 5 were recurrent. Seven patients gave a positive history of gonorrhea, each apparently having been cured with antibiotics. A minimum of four months had elapsed from the time of gonorrheal infection until the attack of epididymitis occurred. Urinary symptoms such as frequency, burning, and dysuria were reported by 18 patients. No patient gave a history of hematuria. One patient had a slight urethral discharge at the time symptoms of epididymitis developed, which was negative for gonorrhea. Another patient had a discharge that was positive for gonorrhea two days prior to the onset of the symptoms of epididymitis.

Of the 92 cases of epididymitis, 52 were on the left side, 39 were on the right, and 1 was bilateral. Examination revealed a moderate to marked enlargement of the whole epididymis in 88 patients, the lower pole alone being enlarged in 4. The epididymis was very hard and tender in all cases. The prostate was considered to be abnormal in 10 patients—enlarged and boggy in 4 of these, indurated and irregular in 5, and definitely enlarged, hard, and markedly irregular in 1, this last case being proved to be caused by tuberculosis.

The white blood cell count was elevated in 24 cases. Of these, the highest count was 20,000 per μl, most patients in this group having counts between 12,000 and 14,000 per μl. The count in the remaining 68 patients was under 10,000 per μl. Urinalysis was reported as negative in all but 26 cases, and most of the positive urines contained only a few pus cells. Prostatic secretions of 11 patients were considered abnormal, with a marked increase in the number of white cells in 2 cases. Urine culture was positive in 13 patients—*Escherichia coli* in 11, *Micrococcus pyogenes* var. *albus* in 1, and *Mycobacterium tuberculosis* in 1.

TREATMENT AND RESULTS

All patients were treated with a firm scrotal support, ice bag, and bed rest, followed in a few days by gradually increased activity with a support. In the late stages, heat in the form of Sitz baths was employed. It has been our impression that the use of cold in the early stages, rather than heat, is more effective in making the patient comfortable and in bringing about rapid resolution. Sixty of the 92 patients were given penicillin, aureomycin, terramycin, or streptomycin, alone or in combination. The remaining 32 patients received no antibiotics.

Most of the patients were quite comfortable after the first 24 hours of hospitalization, and only a few required more than aspirin for the relief of pain. The length of hospital stay varied from 5 to 45 days, the majority returning to duty in 14 to 18 days (table 2). Antibiotics were of value in treating the patients with urinary infection, abnormal prostatic secretion, or constitutional symptoms. The course of events in the remaining patients was

TABLE 2. *Length of hospital stay of 92 patients with epididymitis*

Days	Patients (per cent)
5 - 11	14
12 - 16	41
17 - 25	29
26 - 35	12
36 - 45	4

influenced little or not at all by antibiotics. Of the 92 patients treated, 6 had recurrences. In one patient the inflammation persisted in spite of antibiotics, showed definite evidence of suppuration, and necessitated eventual orchiectomy. Orchiectomy was also performed on the one patient with tuberculous epididymitis. The disease became chronic in four patients and was treated by epididymectomy. There was no evidence of suppuration in the majority of patients. The patients were followed for periods of from 1 to 6 months after release from the hospital. Follow-up examination revealed the presence of a small residual nodule in the lower pole of the epididymis in 66 patients. In the other 26 patients, resolution appeared to be complete. Atrophy of the testis was not observed.

CONCLUSIONS AND SUMMARY

The occurrence of acute epididymitis is a relatively common occurrence among young military personnel, the vast majority of these cases being classified as nonspecific. In the present series of 92 cases, only 2 were found to be specific (1 caused by tuberculosis and 1 by gonorrhea). Of the nonspecific cases most appeared to be abacterial, as evidenced by the laboratory findings and the lack of constitutional and urinary symptoms. Suppuration also was notably lacking. These findings, though not conclusive, lend support to the mechanicochemical theory in the production of the majority of these cases. In those cases that we have classified as abacterial, the use of antibiotics appeared to be of questionable value.

Strain and exertion often play a part in the production of epididymitis, and this is especially likely to happen when the bladder is full. Emptying the bladder prior to strenuous exercise or long marches may possibly be of value in decreasing the incidence of acute epididymitis.

In only an occasional patient with nonspecific epididymitis was surgical intervention necessary. Operative treatment is advisable in chronic symptomatic epididymitis and in stubborn recurrences. Epididymectomy is preferred over orchiectomy as the operative procedure.

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SERVICEMEN AND MOTOR VEHICLES

Service personnel have one of the worst accident records of any group in the nation. Automobiles driven by young servicemen are "an undesirable insurance risk." Military personnel are involved in about one out of every 30 fatal accidents in the United States! Yet servicemen and women don't add up to nearly 1/30 of the total population—nor do they drive even one out of each 30 miles driven in the nation.

While motor vehicle accidents are the major cause of off-duty deaths and injuries in the armed forces, other types of accidents also account for a considerable number of off-duty casualties each year. Off-duty accidents are the most important accident problem facing the armed forces. Strangely enough, these mishaps befall the same men and women who—day after day—cope successfully with far greater risks while on their jobs.

The terrific cost of injuries and fatalities in armed forces personnel cannot be measured accurately in dollars and cents. Merely taking the $10,000 Government life insurance policy which was paid to the beneficiaries of the 3,657 accidental deaths in the armed forces during 1953 contributed the sum of $36,570,000 to the total cost of these accidents.

—THEODORE C. BEDWELL, Jr., Col., USAF (MC)
in *Military Medicine*, p. 436, June 1955

COURSE ON EMERGENCY MANAGEMENT OF THE NATIONAL ECONOMY

The Industrial College of the Armed Forces operates under the direct supervision of the Joint Chiefs of Staff and is charged with bringing the problems and methods entailed in maintaining national economic readiness to the attention of Regular, Reserve, and National Guard officers, and civilians and Government personnel who may hold positions of importance to the national economy in an emergency. The College conducts resident and extension courses, and a series of National Resources Conferences.

Extension Course. A correspondence course on Emergency Management of the National Economy is designed to educate civilian and military key personnel who cannot attend the Resident Course, in regard to the all-important civilian-military relationship upon which the Nation depends in this era of constant readiness. The two are inseparable, and there must be the highest degree of co-operation and understanding.

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Those who wish to enroll in the extension course may communicate directly with the Correspondence Study Branch, Industrial College of the Armed Forces, Washington 25, D. C. A prospectus will be forwarded which outlines the eligibility requirements and includes an application form and necessary instructions.

TRANSVERSE PRESENTATION OF THE FETUS

A Review of the Literature

MARTIN H. DAITCH, *Captain, USAF (MC)*
DAVID C. GUSTAFSON, *Captain, USAF (MC)*

THE IMPORTANCE of transverse presentation of the fetus far surpasses its numerical frequency of occurrence, because the associated fetal mortality is 37 per cent (uncorrected)[1] and the maternal morbidity is still impressively high. Transverse presentation occurs when the fetal longitudinal axis lies at a right or oblique angle to the maternal longitudinal axis. The point of designation of fetal position in this presentation is the scapula.[2] De Lee[3] stated that the incidence of transverse presentation is 1 out of every 200 deliveries, while Gareis and Ritzenthaler[4] reported its incidence to be 1 in 322 deliveries. In spite of the significance of this type of dystocia, one of the first major contributions toward its analysis did not appear until 1932.[4] Prior to this, according to Johnson,[5] the chief contributions were in the German literature and dealt with the optimum time at which version should be carried out.

Etiology. Stevenson[6] recently pointed out the importance of placental position in the causation of this abnormality. In his analysis he found the placenta to be lying in one or the other of the two poles of the uterus in 92.3 per cent of 86 cases. Of these, 48.2 per cent were in the fundal pole and 44.2 per cent were either lower uterine or placenta previa implantations, with placenta previa making up 27 per cent of the cases. He noted that with a polar implantation the length of the uterine cavity was decreased by 20 per cent, causing the amniotic sac to take on a more spherical, rather than ovoid, shape. Multiparity is an important factor, because it not only is associated with a high number of fundal and placenta previa implantations, but also results in relaxed abdominal and uterine walls that permit

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Presented at the meeting of the Alaskan Air Command Medical Society at Ladd Air Force Base, Alaska, 16 November 1956.

From 5001st U. S. Air Force Hospital, APO 731, Seattle, Wash. Dr. Daitch is now at the Detroit Memorial Hospital, Detroit, Mich.

a greater degree of fetal mobility. Other important causative factors include hydramnios, fetal death in utero, ventral hernia,[6] pelvic tumors, full bladder or rectum,[2] bicornate uterus,[1] premature labor, and a contracted pelvis.[7]

Diagnosis. Inspection of the abdomen alone is often enough to arouse suspicion that a transverse presentation exists because the fundus of the uterus lies at a lower plane than usual and the abdominal enlargement is transverse to the mother's longitudinal axis. The head and breech can be ballotted in the iliac fossae.[4] Examination rectally or vaginally may reveal the absence of fetal parts, or there may be a prolapsed extremity, shoulder, cord, or thorax presenting.[2] Roentgenography confirms the position of the fetal skeleton, and soft-tissue technics and cystograms aid in locating the placenta. All patients who are suspected of having a footling breech and those in whom the diagnosis of a breech is uncertain, should have vaginal and roentgenographic examinations to rule out transverse presentation.[8]

Treatment. Transverse presentation is a diagnosis which should be made during one of the prenatal visits.[9] After the diagnosis has been made, an attempt should be made to find the causative factor and locate the placenta, through the use of physical and roentgenographic examinations. External version should be attempted when the condition is diagnosed, unless placenta previa, uterine bleeding, a dead fetus, or hydramnios are present, or when elective cesarean section is planned for some other reason, or when labor has progressed too far at the time of diagnosis.

The dangers of doing external version are minimal if certain precautions are followed. In order to prevent the placenta from being damaged, the part of the uterus that houses the placenta should not be handled. The patient should be prepared by having her bladder emptied. Pillows should be placed under her head, shoulders, and knees in order to encourage good relaxation of her abdomen. Talcum powder may be applied to the abdomen to reduce friction. If the fetal heart tones are found to be normal, external version may then be attempted. With the flat of one's hand, steady, gentle, manual pressure is applied to the fetal pole. After version is accomplished, the fetal heart sounds should again be auscultated and if they are abnormal, the procedure for version must be reversed. The patient should be checked weekly after the 32d week and external version repeated, if necessary.[10] External version may be attempted even when the diagnosis is made in early labor.[1] Spontaneous version to the cephalic presentation occurs in about 27 per cent of the cases.[6]

Patients who have an early rupture of the membranes or a firm, long, and undilated cervix will benefit most from early cesarean section.[11] This is the preferred method of treatment in patients with transverse presentation associated with a live baby unless the cervix is at full dilatation, and one can accomplish internal version easily.[1] Requirements for internal version and extraction include a sound uterus, complete cervical dilatation, no disproportion, and a sufficient quantity of amniotic fluid.[8] Following vaginal delivery, the uterine walls should be manually explored to rule out the possibility of a ruptured uterus.[1] The use of antibiotics, oxygen, and blood, when indicated, are helpful adjuvants to the management of the mother and child.

Complications. In more recent times, maternal deaths from transverse presentation have been uncommon but the morbidity continues to be high. Puerperal infection and hemorrhage have been the leading factors. The major causes of hemorrhage in this condition are placenta previa, abruptio placenta, uterine rupture, and cervical lacerations. Internal version and extraction is not a benign procedure. In 1945, Morrison and Douglass[12] noted that internal version and extraction was second only to previous cesarean section as a cause of ruptured uteri. The fetal mortality is particularly high in vaginal delivery and increases in direct proportion to the duration of labor.[1] Causative factors in fetal mortality include prolapsed cord, anoxia due to uterine tetany, and birth trauma.[2]

EXPERIENCE AT THIS HOSPITAL

During 1954 and 1955, there have been 5 cases of transverse presentation among 2,116 deliveries at this hospital, an incidence of 1 in 423 deliveries. Although we realize that no conclusions can be drawn from this small series, we are reporting our findings. The patients were all in labor at the time of diagnosis, after gestation periods of 29, 30, 36, 36, and 40 weeks, respectively. Possible causative factors for the transverse presentation included a low implantation of the placenta and multiparity associated with a relaxed abdomen in one patient, and a moderate degree of hydramnios in two patients. The causes in the other two patients were unknown. Four of the patients were delivered by cesarean section and one by internal version and and extraction. The latter was in her 29th week of gestation. The four babies delivered by cesarean section are living; the one delivered by internal version and extraction died at one month of age from complications associated with prematurity.

SUMMARY

Although the incidence of transverse presentation of the fetus is relatively low, the associated fetal mortality and maternal morbidity are still impressively high.

The factors operative in producing transverse position of the fetus include polar implantation of the placenta, multiparity, hydramnios, fetal death in utero, ventral hernia, pelvic tumors, full bladder or rectum, bicornate uterus, premature labor, and a contracted maternal pelvis.

Abdominal or rectal examination usually discloses the transverse position. Roentgenography will confirm the position of the fetal skeleton, and the placenta may be located by using soft tissue technic.

Transverse presentation is treated by either cesarean section or version. External version may be attempted unless placenta previa, uterine bleeding, a dead fetus, or hydramnios are present, or labor has progressed too far at the time diagnosis is made. Cesarean section is the preferred method of treatment in patients with a live fetus who are in labor, unless the cervix is fully or almost fully dilated at the time of diagnosis, or internal version may be easily accomplished.

During the two years 1954 and 1955, five patients with transverse presentation have been treated at this hospital. Four of these were delivered by cesarean section and the infants survived. One was delivered by internal version after 29 weeks of gestation, the infant dying one month later from complications of prematurity.

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ARTIFICIAL RESPIRATION TECHNIC FOR INFANTS AND SMALL CHILDREN

At the request of the American National Red Cross, the National Academy of Sciences—National Research Council convened an Ad Hoc Panel on Manual Methods of Artificial Respiration on 8 March 1957 to advise as to the best method presently available for administering artificial respiration to infants and small children. The panel, comprising many eminent authorities on the subject, unanimously recommended the technic herein described.

—Editor

TECHNIC FOR ADMINISTRATION

Step 1

Clear the mouth of any foreign matter with the middle finger of one hand. With the same finger hold the tongue forward (fig. 1).

Step 2

Now place the child in a face-down, head-down position and pat him firmly on the back with the free hand. This should help dislodge any foreign object in the air passage (fig. 2).

Step 3

Place the child on his back and use the middle fingers of both hands to lift the lower jaw from beneath and behind so that it "juts out" (fig. 3).

Step 4

Hold the jaw in the position described in Step 3, using one hand only (fig. 4).

Step 5

Place your mouth over the child's mouth *and* nose, making a relatively leakproof seal, and breathe into the child with a smooth steady action until you observe the chest to rise. As you start this action, move your free hand to the child's abdomen, between the navel and the ribs, and apply continuous moderate pressure to prevent the stomach from becoming filled with air (fig. 5).

Step 6

When the lungs have been inflated, remove your lips from the child's mouth and nose and allow the lungs to empty. Repeat this cycle, keeping one hand beneath the jaw and the other hand pressing on the stomach at all times. Continue at a rate of about

Fig. 1

Fig. 2

Fig. 3

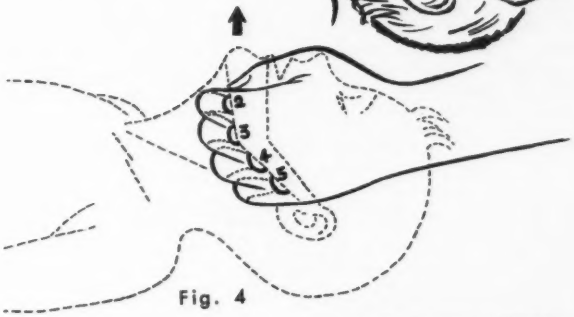

Fig. 4

Fig. 5

20 cycles per minute. After every 20 cycles you should rest long enough to take one deep breath. If at any time you feel resistance to your breathing into the child and the chest does not rise, repeat Step 2, then quickly resume mouth-to-mouth breathing.

USE FOR INJURED ADULTS

The question often arises concerning a technic to use on adults when the chest cage is injured and compression of the chest would do further damage, or when fractured upper extremities would eliminate the expansion phase of "push-pull" technics. The mouth-to-mouth or mouth-to-nose technic may be used in these cases; however, the cycle should be slower than that used for children. Approximately 12 cycles per minute should be adequate. The lower jaw must be held in the "jutting out" position with both hands at all times.

ACKNOWLEDGMENT: The editors are indebted to the American National Red Cross and the National Academy of Sciences—National Research Council for permission to publish the text of this technic, and to the Red Cross for use of their excellent illustrations.

Clinicopathologic Conference

U. S. Naval Hospital, Portsmouth, Va.*

CARDIAC ARRHYTHMIA

Summary of Clinical History. The patient was 33 years old when, on 26 November 1956, he was admitted to a hospital for the first time in his life. During examination for extension of enlistment after 10 years of active duty in the U. S. Navy, it had been noted that his pulse was markedly irregular. He was not conscious of any irregularity and had no complaints of any sort. He had had the usual childhood diseases, none of them serious, and at the age of nine had had pneumonia without any sequelae. He remembered no operations, accidents, or any other serious illnesses. Particularly, there was no history of rheumatic fever. His mother and father had died of unknown causes while he was an infant. Two siblings were alive and well.

During his 10 years in the Navy, he had been in the Philippines, Alaska, South America, United States, Mediterranean, Greenland, South America, and the United States, in that order. He drank about two bottles of beer a day and occasionally used hard liquor. For some years he had smoked one and a half packages of cigarettes per day.

On review of systems, the only positive finding was that the patient occassionally had abdominal pain upon missing a meal. This pain was aggravated by alcohol.

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*Rear Adm. Ocie B. Morrison, Jr., MC, USN, Commanding Officer. From the Pathology Service, Capt. Wilmot F. Pierce, MC, USN, Chief.

Physical Examination. The patient was 67 inches tall and weighed 160 pounds. His temperature was 99° F; pulse, 80; and blood pressure, 116/78 mm/Hg. He was well developed, well nourished, and in no acute distress. One examiner thought that there was slight thickening of the walls of the retinal arterioles. Other than this, there were no abnormalities of the head or neck. His chest was normal in size and shape. Loud expiratory rales were heard at the left base of the chest. His heart was not enlarged to percussion; no murmurs were heard, but the second sound, just to the left of the sternum at the level of the 5th interspace, was split. His pulse was totally irregular and there was a pulse deficit. His hands were cool and damp, and fine tremors of his outstreched fingers were noted. There were no other significant physicial findings.

Laboratory Studies. Hemoglobin was 14.5 grams per 100 ml and the leukocyte count was 6,300. Sedimentation rate was normal. The urine was clear, alkaline, had a specific gravity of 1.020, normal albumin and sugar, and there were from 1 to 2 leukocytes per high-power field. The serum cholesterol was 294 mg per 100 ml. PPD (first and second strengths) tuberculin tests and the Kahn test for syphilis were negative.

A roentgenogram of the chest in the posteroanterior position showed a slight prominence of the heart in the region of the left ventricle, the widest diameter measuring 14 cm in comparison with 29 cm for the widest intrathoracic diameter. Old healed fibrotic disease was evident in the right apex, and there was an increase in markings in the right lower lung field. Oblique views with barium swallow showed no definite chamber enlargement. Cholecystography indicated normal function without evidence of cholelithiasis.

An electrocardiogram recorded an auricular rate of 60, a ventricular rate of 70, and a sinus tachycardia with frequent runs of many multifocal ventricular premature beats from as many as five different foci (fig. 1). At times, as many as nine consecutive ventricular premature beats appeared. The T waves were inverted in leads 3 and V_6.

Course in Hospital. Except for 99° F on admission, the patient's temperature was not above 98.6° throughout his stay in the hospital. Pronestyl (brand of procaine amide hydrochloride), 1,000 mg daily in four doses, was started when he was admitted, and this was gradually increased to 4,000 mg daily by 20 December. An electrocardiogram on 3 January showed fewer premature beats but widening of the QRS complexes. The dose of Pronestyl was diminished to 750 mg four times a day. A basal metabolic rate on 10 January was plus 17. The patient was completely asymptomatic, up and about on the wards, and he was allowed to leave the hospital on regular liberty until 24

January. On that day when he was walking to the hospital, after spending the night at home, he had severe epigastric pain and vomited once. Another electrocardiogram showed some increase in premature beats but physicial examination revealed no abnormalities other than an irregular pulse. In a gastro-intestinal

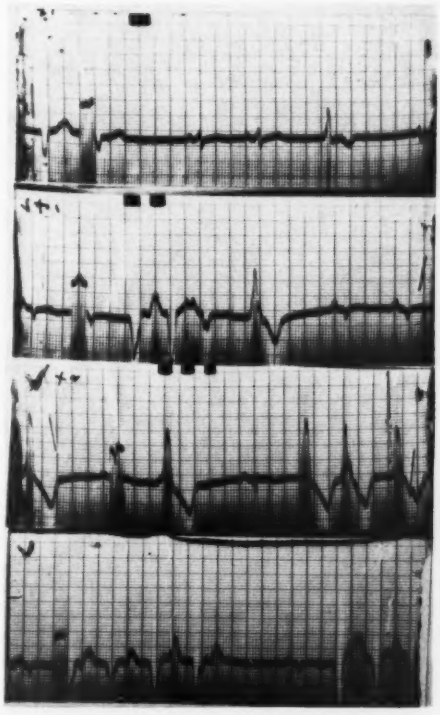

Figure 1. Electrocardiogram showing multiple, multifocal ventricular premature beats.

roentgenographic series on 8 February, inconstant spasm and a crater measuring 1 cm in diameter were demonstrated in the prepyloric area of the stomach; stomach peristalsis was sluggish, and there was minimal residual barium in five hours. The esophagus was normal. The cardiac shadow in these films was enlarged in all diameters. Therapy with Amphojel (brand of a suspension of aluminum hydroxide) and belladonna was instituted and very soon his abdominal pain disappeared. Fluoroscopy on 3 March showed only slight spasm in the prepyloric portion of the stomach, and at intervals, this region filled out well and peristalsis was observed to pass through it.

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On 17 January, a clinical board concluded that further active duty was contra-indicated and recommended that he appear before a Physical Evaluation Board. The diagnosis was ventricular premature contractions, cause unknown.

On 7 March, he died while asleep, during a "sort of convulsion."

DISCUSSION

Doctor Greer:* A young man, 33 years old, was found to have an irregular pulse when he was being examined for re-enlistment in the U. S. Navy, and he was admitted to the hospital for study. He had no complaints at the time and the only positive finding in a review of systems was abdominal pain, that was said to occur when his stomach was empty. The physicial examination revealed questionable sclerosis of the retinal arteries; loud expiratory rales at the left lung base; a split second heart sound at the left sternal border; totally irregular pulse; cool, damp palms; and a fine tremor of the outstretched fingers. The results of laboratory examinations were within normal limits except for a slightly elevated blood cholesterol. A roentgenogram of his chest revealed some prominence of the left ventricle; evidence of old, healed fibrotic disease in the right apex; and some increase in markings in the right lower lung field. Cardiac fluoroscopy did not reveal any significant chamber enlargement. Roentgenograms of the gallbladder were negative. The electrocardiograms showed an auricular rate of 60 and a ventricular rate of 70 with numerous and multifocal premature ventricular contractions, sometime as many as nine at a time. This makes one think that the many consecutive ventricular components were probably runs of ventricular tachycardia rather than just simple premature ventricular contractions.

The course in the hospital was very uncomplicated. The patient was given Pronestyl in rather large doses, and following this there were fewer premature ventricular contractions. His basal metabolic rate was plus 17. A prepyloric ulcer was discovered while he was under observation and this responded well symptomatically. According to the report, the second gastro-intestinal series showed some improvement. A repeat roentgenogram of the chest showed the heart to be enlarged in all diameters. He appeared before a clinical board with a diagnosis of ventricular premature contractions, cause undetermined, and on 7 March he died while asleep during a "sort of convulsions." There are several things that I would like to ask. First of all, I would like to know if he was overweight. Do you happen to know his weight?

Doctor Pierce: He weighed 160 pounds and he was 67 inches tall.

Doctor Greer: Was his blood Kahn test negative?

Doctor Pierce: Yes, the Kahn was negative.

Doctor Greer: And he was not gastroscoped?

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*Comdr. James W. Greer, MC, USN, Medical Service.

Doctor Pierce: He was not.

Doctor Greer: It seems that the occurrence of premature beats was the main reason that this man was in the hospital, and premature beats are not too important clinically unless they do occur from multiple foci and occur frequently. It is said, as I mentioned before, that runs of more than three consecutive premature ventricular contractions are pretty good evidence of paroxysms of ventricular tachycardia. When such contractions occur from multifocal areas, I think one can fairly safely say that there is organic heart disease. We are, occasionally, unable to determine the underlying cause of such heart disease, but I think these findings do indicate advanced myocardial disease and I think that anytime they occur, there is the possibility of impending ventricular tachycardia leading to ventricular fibrillation. Actually, there is not much else to go on in this case. There was no hypertension. There was no electrocardiographic evidence of myocardial damage in the sense of infarction, although because of the premature beats, myocardial disease probably did exist. We have no evidence of thyrotoxicosis. He had a tremor, but he had cool, moist hands and this is against thyroid disease, and an examination of the neck was negative. The Kahn test was negative, so syphilitic heart disease is also rather remote. So I think that probably, if we are going to say that the man had heart disease, it leaves us with arteriosclerotic heart disease, and this is uncommon in a young man of 33 years. However, considerable investigation of coronary artery disease in young men has been carried out by Yater and associates,[1] who reported over 800 cases in men ranging from ages 18 to 40 years, and by French and Dock[2] who reported 80 cases. The findings were about the same: 90 per cent of the patients were overweight, 50 per cent died during vigorous effort, and 10 per cent died during sleep. Arteriosclerosis of the coronary arteries was found in all, but there was generalized arteriosclerosis in only a very small group. So this is a localized, selective type of arteriosclerosis. In 80 autopsies on these young men, 59 per cent showed old infarction and only 19 per cent showed new infarction. All died suddenly, and it is interesting to note that very few of the men who died had cardiac hypertrophy. Here we have a man who died suddenly, and I think that probably a few words should be said about sudden death in young men. It is distressing to the doctor when a young man whom he is treating, dies. I think that the responsible mechanism for sudden death is irreversible cerebral anoxia. It results from sudden, local traumatic, metabolic, toxic, or vascular damage to the brain. There may be exsanguinating hemorrhage resulting in medullary anoxia, or hemorrhage into the pericardial sac with tamponade. A massive pulmonary embolus can cause obstruction to blood flow and lead to sudden cerebral anoxia that can cause sudden death. Ventricular asystole or fibrillation can cause sudden death. Many times, when death occurs suddenly, the pathologist finds nothing to explain the cause. Death may also be caused by cessation of the heart beat that can result from ventricular fibrillation or cardiac standstill. In animal

experimentation, when a coronary vessel is tied, electrocardiograms reveal that death is due to ventricular fibrillation. We also know, from electrocardiographic evidence, that patients in ventricular fibrillation die suddenly. The commonest cause of sudden death is vascular disease of the heart. A ruptured ventricle, complete heart block, ruptured aortic aneurysm, perhaps ventricular fibrillation, and sometimes quinidine therapy are causes of sudden death. Cerebral complications can also cause sudden death. Diseases of the digestive tract and urinary tract can also lead to sudden death. In 60 to 80 per cent of the sudden deaths due to cardiovascular disease, coronary arteriosclerosis is found. It is also interesting to note that studies of a large number of young men who died suddenly showed no evidence of recent infarction and frequently there was no evidence of coronary occlusion; but in all the cases there was evidence of coronary arteriosclerosis.

I do not believe that this man had valvular heart disease because he had no murmurs. The commonest valvular disease to cause sudden death is calcific aortic stenosis. Cerebrovascular accidents are not very common causes of sudden death. In fact, about the only cerebral lesion causing sudden death is rupture of an aneurysm of the basilar artery. An embolus or hemorrhage into the brain does not cause death for 12 to 14 hours; usually it is 2 to 14 days before death occurs. Cerebral embolism occurs most commonly with heart disease. In children, rheumatic heart disease and subacute bacterial endocariditis, and in adults, auricular fibrillation and coronary thrombosis are the two most frequent causes of this. We have several distinct possibilities for the cause of this man's death. In reverse order, I think that a pulmonary mechanism is not too likely. If he had had a pulmonary embolus, it would have to come from the right side of the heart, and thrombi in the right side of the heart, especially from studies of young men, are not nearly as common as thrombi in the left side. As far as gastro-intestinal disease is concerned, there is not much to go on. The man apparently had an ulcer, it was prepyloric, it might have been malignant, but it improved under treatment. We have no evidence that blood came either from the mouth or from the rectum when he died, but I suppose that he might have exsanguinated. May I ask who saw him die? Did a medical officer see him die?

Doctor Pierce: He died at home.

Doctor Green: This "sort of convulsion" must have been the words used by his wife.

Doctor Pierce: Yes.

Doctor Green: Well, it is difficult to diagnose from a wife's opinion as to how her husband died. Considering a neoplasm, he might have had a metastatic neoplasm from a carcinoma of the stomach, but that is not likely. So actually, we are left with cardiovascular death. I think it is unlikely that this was due to myocarditis. We have no

evidence that he had infection or postinfectious diphtheritic or rheumatic myocarditis. This could account very well, however, for the numerous premature ventricular contractions. He also had no symptoms of heart failure although there was roentgenographic evidence of a heart enlarged in all diameters. We have no evidence that there was dyspnea or ankle edema. There is a remote possibility that there could have been some pericardial involvement, or that he could have had metastatic or primary tumor in the pericardial sac or the myocardium. It is also possible that this man could have ruptured a ventricle into the pericardium causing cardiac tamponade. I believe that the man died from coronary arteriosclerosis. I think that the cause of death was ventricular fibrillation.

Doctor Jaruszewski:* Apparently the patient was surveyed with the diagnosis of ventricular premature contractions. I don't see why anybody would do that if his cardiac shadow increased in size from the time he was admitted. Was he discharged from the service?

Doctor Pierce: He was waiting to hear from the Physicial Evaluation Board when he died.

Doctor Jaruszewski: What I am trying to bring out is why he had cardiac enlargement from the time of admission to the second time that the chest films were taken. There is no mention here of any kind of examination of the chest, circulation times, venous pressure determinations, or anything like that. I don't believe he had arteriosclerotic heart disease. Cardiac arrest was due to either fibrosis of the lungs or a tumor of the heart, either primary or secondary.

Doctor Gorlin:** Well, I would agree that this is a most unusual course in a man of 33. I would think that he had some systemic type of infiltrative disease of the heart, but I don't know where to begin with the amount of information that is presented. It was initially thought that there was acute change in heart size as well as arrhythmia.

Dr. Greer's diagnosis:
Coronary arteriosclerosis and ventricular fibrillation

Dr. Jaruszewski's diagnosis:
Fibrosis of the lungs or heart tumor, either primary or secondary

Dr. Gorlin's diagnosis:
Infiltrative disease of the heart

PATHOLOGIC FINDINGS

Doctor Pierce: At autopsy, the heart weighed 500 grams. Patchy gray opacities, somewhat granular in appearance, were evident over the epicardium of the left ventricle. All the chambers of the heart

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*Capt. Edward J. Jaruszewski, MC, USN, Medical Service.
**Lt. Richard Gorlin, MC, USNR, Medical Service.

were dilated, particularly the left ventricle. The right auricle was moderately dilated. The endocardium of the papillary muscles of the right ventricle was slightly roughened by pinhead-sized, glistening, gray nodules. Similar, but more numerous, translucent nodules were incorporated in the endocardium of the left ventricle, particularly concentrated below the anterior cusp of the aortic valve. The myocardium of the right ventricle was thin and pale and there were a few broad, gray scars on the cut surfaces. The myocardium of the interventricular septum was about average in thickness, but on sectioning, instead of the usual red-brown color, the cut surfaces were streaked gray, yellow gray, red yellow, and red. No normal appearing myocardium could be seen grossly. In the left ventricle, the myocardium was somewhat thin, particularly toward the apex, and the cut surfaces were somewhat mottled, deep red, red yellow, gray yellow, and gray. Numerous dense gray scars, up to 1.5 cm in size, were scattered throughout. The myocardium generally was flabby and somewhat friable. The coronary arteries were somewhat thickened and rigid and there were numerous, yellow, atheromatous intimal plaques. The lumens were somewhat diminished, but nowhere was there any evidence of occlusion by thrombi, plaques, or emboli.

The lungs were somewhat edematous. There were some apical adhesions. A small nodule was present just beneath the pleura of the right lower lobe on the lateral aspect, 0.6 cm in diameter. Dense fibrous adhesions were present between the visceral and parietal pleura of the right lower lobe.

The liver weighed 2,200 grams. Glistening, translucent, minute, gray opacities were scattered over the cut surfaces and seemed to follow the distribution of the large vessels. The spleen weighed 400 grams and was soft. No nodules were evident.

A shallow ulceration was present on the lesser curvature of the stomach, approximately 1 cm proximal to the pyloric ring. This was 0.7 cm in diameter and there was some puckering of the adjacent gastric mucosa. Mild gray thickening was evident on the serosal surface opposite the ulceration. There were no abnormalities of any other portion of the gastro-intestinal tract.

There was moderate enlargement of all lymph nodes, especially those in the peritoneal cavity and particularly those about the bile ducts. Except for mild atheromatous changes of the aorta, and of the arteries at the base of the brain, there were no significant gross findings in any of the other tissues.

Histologically, there were granulomatous lesions in almost every organ of the body (fig. 2). These lesions were characteristic of sarcoidosis. No pathogenic organisms were isolated from the cultures of tissue taken at the time of autopsy, and special stains showed no acid-fast organisms or fungi in the tissues. A hamster was inoculated with material from a lymph node. This animal, killed six weeks later, showed no significant tissue alterations.

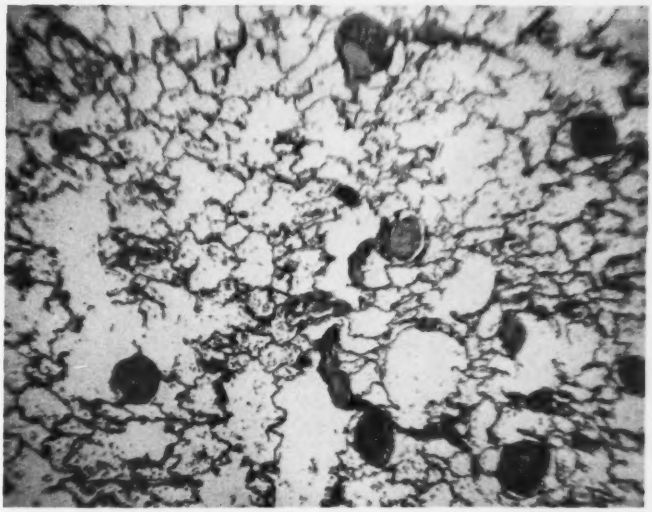

Figure 2. Sarcoid nodules in lung. (× 5)

The heart was extensively involved by the granulomatous process (fig. 3) and, in addition, there were extensive regions of fibrosis, some with hyalinization. There was no particular concentration of the lesions in any of the divisions of the heart. The right and left ventricles, papillary muscles and interventricular septum were all sites of these lesions. Necrosis was not a feature of any of these lesions. It is estimated that about one third of the myocardium was involved, either by scarring or by the granulomatous lesions.

In sections through the gastric ulcer, epithelium covered the entire surface of the crater but there was loss of submucosa, and muscularis mucosa, and a portion of the muscularis. The epithelium lay on a very thin layer of smooth muscle fibers. Considerable infiltration of of the underlying muscle with lymphocytes and large mononuclear leukocytes had occurred, and the vascularity in this portion of the wall was increased. Thickening of the serosa had occurred with proliferating connective tissue. Numerous granulomatous lesions similar to those seen in the heart and the other tissues were evident in the mucosa, submucosa, and the muscularis mucosa of the stomach proximal to the ulcer (fig. 4).

Myocardial sarcoidosis is not a common cause of sudden and unexpected death. On the other hand involvement of the heart, either directly as in this case, or through the pulmonary fibrosis associated with this disease, does occur quite frequently. In the 92 autopsied cases collected by Longcope and Freiman,[3] the heart was directly invaded by the granulomatous lesions in 18 (20 per cent). Five of these patients had died suddenly and unexpectedly. Abnormal electro-

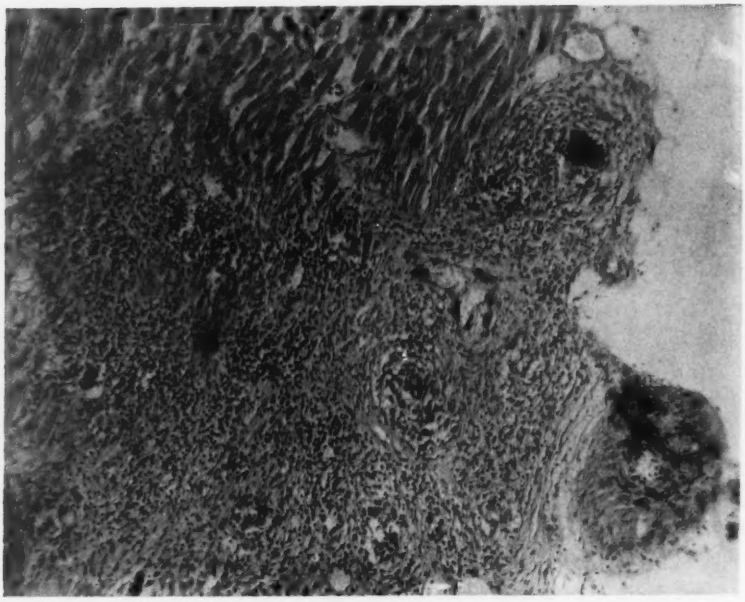

Figure 3. Myocardium and epicardium showing sarcoid nodules, fibrosis, and cellular infiltration. (× 10)

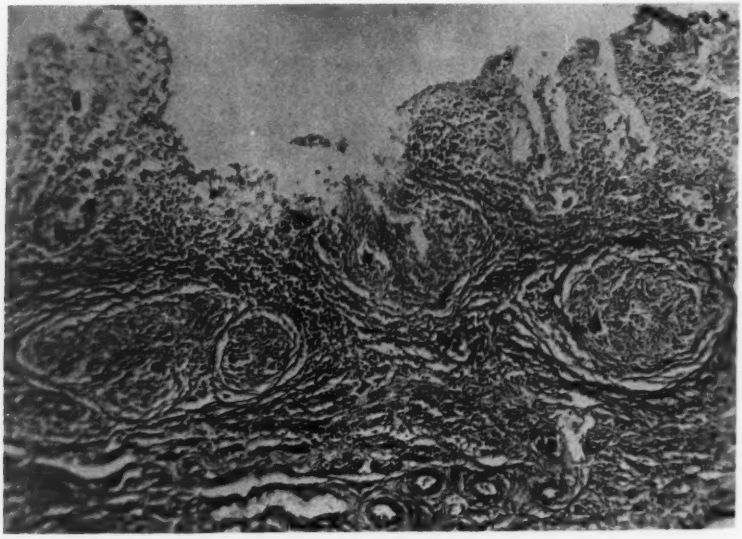

Figure 4. Sarcoid nodules in submucosa of the stomach. (× 10)

cardiograms in the course of sarcoidosis are reported fairly frequently in the literature. In various series which have been published, abnormal electrocardiograms are the rule. This is due in most instances to damage resulting from pulmonary arterial hypertension. Inasmuch as involvement of the heart either primarily or secondarily, can lead to myocardial failure, this is a significant cause of death in patients dying directly of sarcoidosis. Myocardial involvement in the reported cases has varied from a few solitary nodules to extensive infiltration.

Involvement by sarcoidosis of the gastro-intesinal tract, especially the stomach and duodenum, probably occurs fairly frequently. Sirak[4] collected 12 cases from the literature and added one of his own. In these 13 cases there were ulcers of the lesser curvature in 3 and ulcer of the duodenum in 1. Other effects are antral deformities, pyloric narrowing or deformity, constriction of the duodenum, and linitis plastica.

Pathologic diagnoses:

1. Sarcoidosis, with extensive fibrosis involving the myocardium, lymph nodes, lungs, liver, spleen, bone marrow, kidneys, prostate gland, stomach, thyroid gland, dura, and leptomeninges.

2. Prepyloric ulcer, lesser curvature of the stomach. Healed, with mild, chronic, interstitial inflammation.

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IRELAND ARMY HOSPITAL DEDICATED AT FORT KNOX, KY.

CHARLES L. EVELAND, *Captain, MSC, USA*

THE new multistory, 500-bed Ireland Army Hospital was formally dedicated 1 April 1957, at Fort Knox, Ky. This towering, impressive hospital, first of its kind to be completed, cost $8,500,000 exclusive of equipment, and epitomizes the latest thinking in the design and construction of hospitals.

A view of the main entrance to the new Ireland Army Hospital a few days after full operations were resumed. The entranceway on the left leads to the central clinics area, the small wing on the right houses the headquarters of the hospital.

Constructed along highly functional lines, the new building features centralized clinics, cascade oxygen supply, a 30-circuit central dictation network, and a 44-station pneumatic tube message carrier system among other innovations. The new hospital replaces an old cantonment-type structure, utilized for a number

From Ireland Army Hospital, Fort Knox, Ky.

of years as the U. S. Army Hospital, Fort Knox, Ky. Built on a 1,000-bed chassis, Ireland Army Hospital can become a 1,000-bed facility with the construction of two additional 250-bed wings.

During the dedication ceremony, Major General John L. Ryan, Jr., Commanding General of the U. S. Army Armor Center, Fort Knox, Ky. presented the keys of the hospital to Colonel Kenneth A. Brewer, MC, Hospital Commander. Mrs. Merritte Weber Ireland unveiled a large bronze dedicatory plaque inscribed in honor of her husband. The plaque, mounted in the main lobby of the new hospital reads as follows:

IRELAND ARMY HOSPITAL

This Hospital Was Named In Honor Of

MAJOR GENERAL MERRITTE WEBER IRELAND

Born 31 May 1867, Died 5 July 1952

THE SURGEON GENERAL, UNITED STATES ARMY

4 October 1918 to 31 May 1931

Dedicated 1 April 1957

Major General Silas B. Hays, Surgeon General, United States Army, gave the dedication address. Speaking to a group of distinguished visitors which included Mrs. Merritte Weber Ireland and Doctor Paul M. Ireland; Doctor W. Palmer Dearing, Deputy Surgeon General, U. S. Public Health Service; Major General Keith R. Barney, Director of Installations, Department of the Army; Major General William H. Powell, Deputy Surgeon General, U. S. Air Force; and Rear Admiral Bruce E. Bradley, Deputy Surgeon General, U. S. Navy; Major General Hays paid great tribute to the officer in whose name the hospital was dedicated, saying:

With this hospital we are starting a new tradition. We have had "named" hospitals, and we have had "post" or "station" hospitals. As our new permanent post hospitals are completed and put into operation we plan to name each one. It is fitting that this, the first hospital to be completed under our construction program, bear the name of one of the most illustrious medical officers in the history of the Army.

The United States Army has been fortunate in furnishing to the Nation many of its outstanding leaders in public life. Likewise the Army Medical Service has been fortunate in developing outstanding medical men of national stature—Beaumont, Letterman, Gorgas, Sternberg, Walter Reed, Keller, Craig, and Simmons to mention only a few. High on any list of Army medical men is the name of Merritte W. Ireland for whom this hospital is named.

It is not my intent to give here today his biography, or to cite all his honors and accomplishments. These have been recorded and are a part of our national medical literature. I would indeed be remiss, how-

ever, if I did not outline for you a few of the highlights of his life to indicate why this hospital is being named for him.

General Ireland was born in 1867 in Columbia City, Ind., approximately 200 miles from Fort Knox, the son of a family doctor. At the age of 23 he received an M. D. degree from the Detroit College of Medicine, and one year later another from Jefferson Medical College in Philadelphia. That same year, 1891, he applied for a commission in the Army Medical Corps and was the only one of 10 candidates to be commissioned. . . . Fifty-nine years later, in 1952, at the age of 85, he died and was buried in Arlington. . . .

Major General Merritte W. Ireland, Surgeon General, United States Army, from 4 October 1918 to 31 May 1931. A large replica of this portrait now hangs in the main lobby of Ireland Army Hospital.

General Ireland's early service was mostly on posts in the West, but during the Spanish American War he went to Cuba with a division hospital and then to the Philippines for a tour of duty. From 1902 to 1912 he served in the office of The Surgeon General, much of the time as Chief of the Personnel Division. Here he garnered experience and background which was to serve him in good stead in later years as Surgeon General.

In World War I he became Chief Surgeon of the American Expeditionary Force, and won the highest commendation from his close personal friend, General Pershing. At the end of that war he was appointed Surgeon General and served in that capacity for 13 years until his

Following the climax of the dedication ceremony, Mrs. Ireland stands in front of the dedicatory plaque which she has just unveiled, with her son, Doctor Paul M. Ireland, and Major General Silas B. Hays, The Surgeon General of the United States Army.

retirement in 1931. During his administration, Walter Reed and Letterman Hospitals were rebuilt and William Beaumont Hospital was constructed. He established the Medical Field Service School in which thousands of officers and enlisted men of the Army Medical Service

have been trained. And it was he who brought interns into our Army hospitals and began the professional training program of which we are so proud.

In a lecture which he gave in Philadelphia in 1939 at the age of 72, General Ireland said, "What I am the Army has made me; what honors have come to me to brighten and ennoble my life, however undeserved, were the free gifts of my comrades in the Army and of my Government. The Army has always been my first love, and I shall go to my grave believing that it is the truest exponent of American democracy and that in its Medical Department are to be found the highest ideals and principles of the healing art."

Both the Army Medical Service and Fort Knox have reason to be proud to dedicate this hospital today to one who treasured and revered the Army as did Major General Merritte W. Ireland.

TEACHERS OF MEDICINE

"One of the diseases of our society is this erroneous belief that the brave new world will come to pass by miracles of structural design and intricate organisation alone. Plans there must be, but personalities must take precedence of plans. The basic essential is to ensure that medical students, both undergraduates and post-graduates, are associated with (not just taught by) those whose lives and work are examples of excellence in scholarship and professional skill. These teachers must be ever dissatisfied with their efforts, critical of themselves and others, forever scheming and striving to test the truth of what appears to be known, and planning to enlarge knowledge. Among such there is no room for the complacent, the arrogant, the staunch upholder of tradition, and the stout defender of the of the status quo. The quality of our teachers is all important and a heavy responsibility rests on those who have to select the academic staffs and consultants responsible for medical education."

—W. MELVILLE ARNOTT, M. D.
in *Lancet*, p. 785, Oct. 15, 1955

ROLE OF PHYSICIANS IN RECOMMENDATIONS OF COMPASSIONATE PERSONNEL ACTIONS

JAMES J. GIBBS, *Major, MC, USA*
RALPH W. MORGAN, *Major, MSC, USA*

A WELL-KNOWN aspect of Army life is the lack of choice in the duration or location of duty assignments. This may produce stressful situations if members of the serviceman's family are unable to adjust to a particular environment or if his impending or actual separation from the family comes at a time when his presence is necessary because of serious illness, death, legal difficulties, or other problems in the immediate family. Aware of its responsibilities, the Army has provided for the alleviation of such family hardship through compassionate personnel actions. These include emergency leave, extension of such leave, deferment of overseas assignment, and compassionate reassignment.

The magnitude of this problem is emphasized by the approximately 2,000 requests for compassionate personnel action which reach the Office of The Adjutant General of the Army each month. This includes only those requests which are required by Army regulations to be processed by the Emergency Return Section of The Adjutant General's Office at Department of the Army level. Many others are acted upon by major commanders so that the total far exceeds 2,000 per month. Because the majority of requests for such actions involve physical and/or mental illness of a member of the serviceman's family, military and civilian physicians are frequently called upon for statements concerning the medical status of the dependent.

Medical reports frequently contain vague, incomplete information and unrealistic recommendations which result in a delay of administrative action, and recriminations by the serviceman and his family when requests are not favorably considered. A simple statement of the presence or absence of a physical or mental illness may present no difficulty; however, the emotional, legal, economic, social, and administrative aspects of a family medical problem may introduce complications which must be considered in the medical report.

From Professional Division, Office of The Surgeon General, Department of the Army, Washington, D. C.

In addition to safeguarding the serviceman and his family, the final decision must also consider the necessity of accomplishing the military mission. Whether compassionate personnel action would aid or correct the situation and not foster overly dependent behavior and thus initiate or continue maladjustment of the family to military life must also be considered. It should be recognized that in many cases a hardship exists which cannot be remedied by leave or reassignment, but only by discharge from the service.

Each request for compassionate personnel action is handled on an individual basis. From an administrative standpoint, it would be advantageous to include in *Army Regulations* the specific criteria used in determining the merits of each case. However, illness and other vicissitudes, with their diverse effects upon individuals, and the innumerable situations that can produce severe hardships, make it impossible to cover each situation. Therefore, regulations can be used only as a guide.

RETURN OF PERSONNEL TO U. S.

Reasons for Return

AR 608-40[1] states that the following or related cases will be considered as reasons for return of the serviceman to the United States or Territory of residence under emergency conditions for a period of 30 days:

a. When the death of the wife or unmarried minor child of a serviceman has been verified by the American Red Cross.

b. When the return of an individual will contribute to the welfare of a dying member of the immediate family (immediate family to include only father, mother, a person *in loco parentis,** spouse, children, brother, sister, or only living relative). An example would be an elderly mother with a chronic heart condition which has reached a terminal stage.

c. Where, through the death or serious illness of, or accident to a member of the individual's immediate family, important responsibilities are placed on the individual which must be met promptly, cannot be accomplished from overseas, and cannot be discharged by any other individual. For example, a spouse who develops an acute overt psychosis, leaving three minor children unattended.

d. For other emergency situations which may not specifically meet the above requirements, but where the failure of the individual to return would create a severe and unusual hardship

*Persons to be considered *in loco parentis* must have replaced and assumed all of the obligations of the natural parents of the member (including financial support) for the bulk of the member's minority.

on either himself or his family and the return is required within a period of 20 days.

Return of Serviceman Requested by Family

The procedure to be followed when family members request the return of military personnel to the United States or Territory of residence is as follows:

a. A request for return is submitted by family members to the local chapter of the American Red Cross. The American Red Cross obtains all information available, including medical documentations when indicated. The local chapter then forwards a report to its National Headquarters which in turn submits it to The Adjutant General, Department of the Army, Washington 25, D. C., or Commanding General of an area where authority from The Adjutant General is not required.

b. Requests which reach the Emergency Return Section of The Adjutant General's Office are carefully reviewed. If information is incomplete, final decision may be delayed until additional reports are obtained. Favorable consideration results when the American Red Cross welfare reports and the medical statements indicate that the case has merit, and that the current Army mission allows the granting of the request. The officers of the Emergency Return Section are placed in a very difficult position if the physician lacks a proper appreciation and understanding of the military problem. The staff of the Emergency Return Section has access to expert medical opinion from the Office of The Surgeon General to assist them in evaluating medical problems.

Case example 1. A five-year old dependent daughter of a serviceman was diagnosed by a medical officer as suffering from bronchial asthma. He wrote a strong medical statement recommending that the serviceman be reassigned to a post in Arizona or Nevada for this reason. This recommendation was made in spite of the fact that the child had never resided in these States and her asthma appeared to be relatively well controlled on medication. Upon the advice of the Medical Consultant to The Surgeon General, this request for compassionate transfer was refused. The serviceman, incensed at what appeared to him to be a medical decision being made by a physician who had never seen his child, appealed to his Congressman, who also questioned the Medical Consultant's recommendation in this case.

Comment. It can be seen that this medical recommendation resulted in the serviceman and his wife feeling as though an injustice had been done, even though sound medical experience dictated this course of action. Had the physician encouraged the parents to accept their child's illness and to follow the prescribed treatment it would have been better for all concerned.

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FOREIGN SERVICE

Personal Hardship

There is no specific regulation which deals with compassionate reassignment. Consequently most of the criteria stated in AR 614-30,[2] which deal with overseas deferments, are applied to such cases. This regulation states, in effect, that personnel alerted for or on orders to overseas commands, may be granted temporary deferment when compliance with such orders will impose hardship upon the individual or his family under the following criteria:

a. Illness of a member of the immediate family of the individual provided that:

(1) In the opinion of the attending physician

(a) The illness is such that the patient cannot reasonably be expected to live longer than one year.

(b) The illness is of such a nature that the individual's presence is an important factor in the patient's recovery; whereas his immediate departure might have a serious adverse effect upon the patient. A case having merit under this criterion would be that of a dependent recovering from a severe illness of recent onset, such as coronary thrombosis.

(c) The legal wife of the individual is in her seventh month of pregnancy (this criterion is utilized only for overseas deferment).

b. Financial or domestic hardship involving the immediate family, provided that the individual's presence during the period of his deferment will effect reasonably permanent relief which cannot be achieved by other satisfactory means.

PRINCIPLES

Each request for compassionate personnel action requires documentation and the exercise of sound judgment before any action is taken. The physician's statement becomes of paramount importance in any such action, and if he is to discharge satisfactorily his responsibility he must be aware of certain stated and implied principles that in the final analysis determine the decision rendered in each case.

The expeditious accomplishment of the Army mission is of primary importance. When the medical officer makes a medical recommendation he may not be primarily concerned with the feasibility of his recommendation. A medical recommendation which is not consistent with the mission of the Army sets up a chain reaction which does not serve the best interests of the patient or the service. In case example 1, it is clear that the

Army could not be expected to utilize efficiently an individual whose assignment would be permanently limited to two states in the Southwest. Moreover, the normal vicissitudes of the service must be shared by all. Resignation or application for hardship discharge would be the proper solution for long-term, family medical problems which do not lend themselves to service life, rather than expecting others in the Army to assume an unfair share of overseas or isolated assignments.

The requested action must alleviate mental anguish and/or enable the serviceman to perform an emergent legal obligation for which he has primary responsibility. The usual purpose of compassionate personnel actions is to relieve mental anguish on the part of the member and/or persons in his family. Mental anguish is a subjective state in which the individual suffers intense and painful psychic distress, such as guilt, anxiety, depression, and the like. The effect upon the individual of mental anguish ranges from temporary loss of emotional control through multiple somatic symptoms, to few or no external manifestations. Usually, however, there is great preoccupation with the family problem, which often results in inattention to duty and a marked decrease in motivation toward military service.

If the mission permits, it is to the benefit of the Army to alleviate the mental anguish of the member through a compassionate personnel action. In some cases because of marital estrangement, immature behavior patterns, or other reasons, the serviceman may not desire emergency leave or compassionate reassignment. However, when the serviceman has a primary legal responsibility which cannot be discharged without his presence, the proper headquarters may issue appropriate orders returning him to the United States even though he expresses no desire to do so.

Case example 2. A serviceman had not communicated or lived with his wife for five years although he continued to support her and their child. When his wife became acutely psychotic while he was overseas, his emergency return was requested for the purpose of arranging for commitment of his wife and care of his child. He, however, showed no interest in returning to the Continental United States, but was ordered to do so because no one else was available to assume his legal obligation to care for his family.

Severe objective hardships which can be alleviated only by the presence of the member must exist. Since mental anquish is so subjective and highly personalized, the quantity and quality of the external stress necessary to induce mental anguish varies widely among individuals. In view of this, a definition of objective situations which will always result in mental anguish

in an individual is not possible. Similarly, the usual requirements of the service which may cause separation of the serviceman from his family, such as foreign duty, combat, or even garrison duty in the United States, may cause a substantial degree of mental anguish to dependents with immature or pathologic personalities. In fairness to all concerned, the previously cited regulations, AR 608-40 and AR 614-30, should be used as objective guides as to the personal hardships which will be considered valid criteria for compassionate personnel action.

EMOTIONAL DISTURBANCES

While most physicians have little difficulty in correctly assessing the objective hardships which stem from organic illness or injury, the contrary is true in those cases when the mental anguish itself appears to stem from an emotional disturbance of dependents. Moreover, it is usually quite difficult to determine the severity of the objective hardship in such cases. A detailed discussion of this aspect is therefore in order.

Dependents with an overt psychosis or severe depression present no particular problem because the disabling aspects of their symptoms are usually quite apparent. Character and behavior disorders and neuroses, however, create much more difficult problems in determining the necessity of returning the serviceman to his family.

Dependents who exhibit immature and inadequate patterns of behavior often react quite vigorously to a temporary separation from the serviceman. Characteristically such individuals have less tolerance for frustration, and more difficulty with authority figures. Hostility is poorly controlled and dependency and inadequacy interfere with the effective utilization of available resources. Egocentricity magnifies hardships. Such individuals act out their conflicts, and are adept in environmental manipulation.

Transient neurotic symptoms may mask the manipulative quality of the immature person. One often finds that such patients have refused assistance from others because they are determined that nothing will make them feel better until the serviceman is returned. Threats of suicide or suicidal gestures are not uncommon. Their dramatic behavior may so thoroughly convince relatives, friends, and even the physician that the serviceman must be brought home that other solutions are not even considered.

Case example 3. This is cited to illustrate the above points. Emergency leave was requested and given to a noncommissioned officer on the basis of the medical officer's report which in essence stated that the Sergeant's wife was suffering from a severe nervous disorder which required her hospitalization for six days. She was said to have lost control of herself and to be cap-

able of losing interest in herself and child. Suicide was considered a serious possibility. The medical officer stated it was imperative that her husband be with her.

While on emergency leave the Sergeant then requested a compassionate reassignment from Korea to the United States. Although his wife improved when he came home on emergency leave the medical officer was of the opinion that any absence of the serviceman would cause a relapse and possible suicide, and furthermore, that there was no medicine or medical attention that would prevent her from this act.

About two months after the case was first opened, the patient received a psychiatric examination. The psychiatrist's diagnosis was that of unstable personality. The 27-year-old wife and her infant son lived with her parents while the serviceman was away. About two months after his departure she began drinking excessively in the company of male friends. She didn't like staying at home "because no one would smile." At one point she threatened to leave home with her child as long as her husband was absent. Once, while intoxicated, she jumped in front of her mother's car in order to "end it all." She was not struck by the car. The circumstances surrounding her short hospitalization were never clear, but alcohol was an important factor.

The psychiatrist found no evidence of psychotic symptoms or depression. She denied being depressed but said that she was concerned about what was going to happen. She thought most people disliked her, but this didn't appear to be paranoid ideation. There was no suggestion of anxiety or tension. The psychiatrist commented that he was of the opinion that this patient had a chronic fixed personality disorder, and that she would need guidance and a protective influence. He also believed that it would be hazardous for her and her child if she were left to her own devices, and he recommended that her husband remain with her at this time and in the indefinite future.

Comment. In view of this recommendation a hardship discharge for the serviceman was recommended as the solution to the problem presented in this case. The record indicates, however, that this patient was approached from a negative point of view and nothing of a constructive nature was attempted. In essence, she had favorably manipulated her environment by using immature and impulsive behavior without anyone exploring the possibility that she possessed more effective means of adjusting to a temporarily stressful situation.

The neurotic dependent has usually received some secondary gain from illness at one time or another, and when separated from the serviceman may have an exacerbation of the neurosis. This patient may evoke a positive response from the physician,

and even appear to be a likely candidate for psychiatric treatment. Many therapists state that the serviceman's return home is required before treatment can be successful. If we think of psychiatric treatment as a method for helping the patient achieve more maturity and develop better ways of adjusting to life's many frustrations and adversities with less discomfort, the serviceman's return home because of her emotional illness could be a deterrent to successful treatment by enhancing the amount of secondary gain, by decreasing or eliminating motivation for treatment, and by fixating and encouraging a pathologic pattern of behavior.

Case example 4. A recent case having some relationship to this point of view was that of a serviceman who requested a compassionate reassignment from his overseas duty station to a specific unit stationed in a fairly large city because of his wife's health. His wife's emotional illness dated back to 1940 when she first required treatment. She had required therapy intermittently since then, and usually as the result of her husband's absence. Except for one brief period she refused treatment from Army psychiatrists. She never accompanied or joined her husband on his overseas tours because of her illness and the advice of her physician.

This patient had been seen by a number of psychiatrists and physicians. There was general agreement that she had chronic, severe neurosis characterized by multiple phobias, depression, and panic states. She was described as an extremely dependent and insecure person who was unable to adjust well to responsibilities and to being alone.

Comment. While it is clear that the wife in this case and her husband both were suffering considerable mental anguish because of their enforced separation, it is also evident that the assignment of this serviceman as requested would not be equitable to others and would in no way contribute to a permanent solution to a problem which was essentially unsolvable within the Army environment. In this case resignation from the service was offered and was accepted by the serviceman as a solution to the problem his wife's emotional disability presented.

PRACTICAL SUGGESTIONS

Treatment

The medical officer must appreciate the fact that separation of a serviceman from his family may induce hardship, inconvenience, discomfort, or anxiety. It is highly improbable that anyone, whether physician or layman, can completely alleviate these conditions. On the other hand, it is equally unreasonable to believe that the physician has nothing of value in his armamentarium for dealing with the emotionally distraught

dependent. This may not necessarily require medication or other formal treatment procedure, but may consist only of the reassurance that the patient gains from a thorough evaluation—followed by a calm summation of the facts and forthright discussion as to the course of action to be followed.

If, during the course of these procedures, the physician clearly defines the reality of the patient's situation and firmly indicates, when he believes the facts so warrant, that the serviceman's return is not necessary, the patient frequently will have a reasonable chance of remaining effective. Somatic complaints, or even true illnesses, are then less likely to become a route of escape. The patient is then better able to utilize her own emotional strengths and the variety of assistance which may be available from relatives or from various social service organizations.

Most therapeutic procedures will give discouraging results when the patient's presence in the physician's office is motivated not so much by incapacitating symptoms as by a desire for his support in requesting some type of compassionate personnel action. It behooves the physician to be alert to such a possibility if he is to be of service to his patient. His therapeutic efforts will be futile until he clarifies his position. When the patient has been informed that the doctor will prescribe treatment as indicated by his examination and will not give the patient the statement he or she desires unless indicated, the doctor and patient will no longer be working at cross purposes. This mutual understanding then may pave the way for constructive therapeutic endeavors.

Most medical officers will recall at least one case in which the patient failed to keep future appointments or in other ways indicated little motivation for further medical assistance after she had obtained a favorable medical statement—only to return at a later date when the request for compassionate personnel action was denied.

Referral to Social Service

When the dependent is so emotionally immature or upset that she does not accept a medical recommendation made in the foregoing manner, the physician is often tempted to make recommendations which are unjustified by the facts of the case because of a personal need to "do something," and because he is unaware of the many agencies which are usually available to assist him in cases of this nature.

When the physician has determined that a medical recommendation for compassionate personnel action is not justified, or he desires an objective study of the dependent's situation prior to making the actual determination, he will find that referral of the patient to a qualified social agency is usually quite

helpful. In hospitals referrals may be made to the Military Social Work Service or the American Red Cross Hospital Social Service. In small hospitals or in dispensaries in civilian communities the dependent can be referred to the local American Red Cross Chapter or other available social agency.

Social workers are often of distinct value in providing dependents with the emotional support they may require to continue functioning in times of illness or other stress, and in mobilizing community resources to help solve or alleviate the patient's problem. The physician who refuses to make an unjustified medical recommendation for a compassionate personnel action at the behest of an immature or neurotic dependent and who follows through by a referral to a competent social agency is acting in the best interest of the patient, the serviceman, the Government, and himself. Unless such referral is made the dependent often continues to "shop" for a medical recommendation to the detriment of herself, and the medical facilities which she frequents—especially if she is ultimately successful in her efforts.

Content of Medical Recommendations

The content of the medical recommendations should conform to the principles of sound medical practice. It is most important for the doctor to use factual descriptions if his report is to reflect accurately his evaluation of the patient. The use of general terminology which can be interpreted in many ways and which does not indicate the degree of incapacitation seriously limits the value of a medical evaluation. Terms such as "anorexia" and "insomnia" only mean that the patient has difficulty in eating and sleeping. To say, however, that the patient lived on cigarettes and coffee to the point that she has lost 10 pounds within 2 weeks, and has slept no more than 1 to 2 hours each night during the same period of time clearly communicates to someone else the severity of the symptoms.

Pertinent historical data should not be sacrificed for the sake of brevity. When compassionate personnel action of some type is being considered it is important to have an impression of the patient's past performance when confronted with a stressful situation. One may find that the patient reverts to habit patterns which could aggravate an organic illness or result in serious neglect of minor children. More often, however, it is apparent that the subjective complaints become aggravated in the absence of objective evidence that the illness has become more severe. Where the information requested is too voluminous or detailed for inclusion in an Army Red Cross report or a telegram, it should be forwarded by the next most expeditious means.

No medical report is complete without mentioning treatment. In addition to the type and duration of therapy, the patient's

motivation and co-operation is worthy of comment since no treatment program is of value unless the patient adheres to it. Where secondary gain from illness is a factor it may at times be naive to assume that a patient will diligently follow the doctor's orders.

Diagnosis can usually be stated clearly, but the physician may be reluctant to make statements as to prognosis. Some estimation of prognosis is necessary in considering compassionate personnel actions to avoid premature to delayed assignment changes which hinder the effectiveness of the soldier and increase rather than decrease the mental anguish and hardship involved.

Case example 5. The child of a serviceman was diagnosed as having acute leukemia. For medical reasons the family was not fully informed of the nearness of the child's death. The serviceman, upon receiving orders for overseas, complied with these orders, only to find it necessary to return within a few months in the final weeks of the child's life. Had the physician taken the initiative in this case in encouraging the serviceman to apply for deferment from overseas movement substantial mental anguish would have been saved this family and the business of the Government could have been conducted more efficiently.

The physician should not include in his medical statement unverified statements from the patient. Overtreatment in the form of recommending compassionate reassignment when an emergency leave would suffice, or otherwise letting the patient dictate the form and duration of treatment, should be avoided in the best interest of the patient and the service.

Administrative Considerations

Local policy accounts for wide variations in the manner in in which medical statements are initially processed. In some facilities all medical statements must be routed through the Adjutant; in others the registrar or commanding officer of the medical holding detachment had this responsibility. In absence of policy in this regard the medical officer would be well advised to route all such statements through the administrative office responsible for the maintenance of the patient's records. This is to protect the medical officer and his unit commander against administrative or legal repercussions because of an unauthorized release of medical information. In case of patients not subject to military law, no formal medical statement should be released without first obtaining specific written permission from the patient, except under the provisions of paragraph 15 a, AR 345-20.

Recommendations

It is believed that by giving serious consideration to the principles already mentioned, part of the physician's dilemma

may be solved. Based on these principles he may come to one of three conclusions regarding a request for compassionate personnel actions. Proper recommendations can then be made as follows:

1. The case has merit and favorable action is justifiable.

2. The case lacks merit and favorable action is not necessary.

3. The condition in question is chronic in nature and the problem it has created remains unsolvable within the Army environment. The same may be true where the dependent has a character and behavior disorder which is so severe that the serviceman's absence inevitably results in the neglect of minor children, economic disaster, or antisocial behavior which realistically hinders the serviceman's performance of duty.

CONCLUSION

An attempt has been made to provide physicians with a proper appreciation of their role in recommending compassionate personnel actions in relation to members of the Army. The military, medical, psychiatric, social, and administrative aspects of medical recommendations for such actions have been discussed and practical suggestions made in the writing of medical statements and for improving the care of patients seeking compassionate personnel actions.

REFERENCES

1. AR 608-40 (14 Feb 1956): Return of Military Personnel to U. S. or Territory of Residence for Emergency Reasons.
2. AR 614-30 (14 Mar 1955): Foreign Service.

ARMY TESTS FOR ASSESSMENT OF INTELLECTUAL DEFICIT

ERNEST K. MONTAGUE, *Lieutenant Colonel, MSC, USA*
HAROLD L. WILLIAMS, *Captain, MSC, USA*
ARDIE LUBIN, *Ph. D.*
CHARLES F. GIESEKING, *M. A.*

THE estimation of cognitive deficit caused by illness is of importance to the military medical services. In the Army, all enlisted personnel take two tests of mental ability when they enter, and these tests can be used as estimates of the premorbid intellectual level of a patient. The same tests can be used after injury or illness to measure any intellectual deficit that results.

The first section of this article describes the tests administered at entry into the Army. The second section furnishes technical data for the assessment of intellectual deficit. The third section provides a basis for comparing scores on the Army Classification Battery with scores on the Wechsler-Bellevue scale.

THE ARMY TESTS

At the present time each enlisted man takes two kinds of tests: (1) the Armed Forces Qualification Test (AFQT), which is used to estimate intellectual level, and (2) the Army Classification Battery (ACB), which is used for occupational classification. All enlisted men in the Armed Forces take the AFQT. However, the Air Force and Navy have developed their own classification batteries.

Both the AFQT and the ACB were developed from the Army General Classification Test (AGCT), which was administered to all Army enlisted men from 1940 to 1945. The AGCT was a spiral omnibus test (*i. e.,* the items were arranged in order of increasing difficulty and a single score was obtained) using three types of items (spatial visualization, vocabulary, and arithmetic reasoning). This score was adjusted so that the general mean was 100, and the standard deviation was 20.

From Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D. C. Col. Montague is now assigned to Office of the Surgeon General, Department of the Army, Washington, D. C.

The AFQT is also a spiral omnibus test. The scores are *percentiles* going from 0 to 100. This test has been revised periodically to take care of security leaks, obsolescence of items, revised standards, and improved methods of testing. Forms 1 and 2 of the AFQT were used from 1950 to 1952. They contained the same three types of items found in the AGCT (verbal analogies, arithmetic reasoning, and spatial relations). Forms 3 and 4 of the AFQT were used from 1953 to August 1956. These forms introduced tool usage items. Altogether, there were 100 items, 25 of each type. Forms 5 and 6 are now being used. They are essentially similar to Forms 3 and 4.

The ACB has been given to all enlisted men inducted into the Army since 1948. There are 10 tests in the ACB. These tests are used by the Classification Officer for assignment of Enlisted Men to various military occupations. As in the AGCT, the mean of each test is 100 and the standard deviation of each test is 20.

The ten ACB tests[1] are described below. With the exception of the Radio Code Aptitude Test, all the ACB tests are in paper-and-pencil form.

Army Classification Battery (ACB) Tests

1. *Reading and Vocabulary Test, RV-1 (PRT 1161) and RV-2 (PRT 1164).* This test contains a number of reading passages of one or more paragraphs. Several four-alternative, multiple-choice items are based on the content of each paragraph. The reading matter varies from a simple description of Army camp activities to complex technical information. There are 53 items; the time limit is 25 minutes.

2. *Arithmetic Reasoning Test, AR-1 (PRT 1167) and AR-2 (PRT 1170).* In this test each item is an arithmetic problem presented verbally, with four alternative responses. Some items are based on scales, dials, tables, or graphs. There are 53 items; the time limit is 35 minutes.

3. *Pattern Analysis Test, PA-1 (PRT 1173) and PA-2 (PRT 1177).* In this test a two-dimensional pattern with numbered lines is presented along with the corresponding three-dimensional figure made by folding the pattern along the indicated lines. The edges of the figure are lettered. The examinee is required to identify the lettered edge of the figure corresponding to a numbered line in the pattern. The numbers in the pattern are the item numbers and the letters of the figure are used to form five-alternative responses for each item. There are 50 items; the time limit is 20 minutes.

4. *Mechanical Aptitude Test, MA-5 (PRT 1157 and MA-6 (PRT 1158).* In this test each item consists of a figure illustrating

some physical principle and a verbal question with two, three, or four alternative responses. There are 45 items; the time limit is 15 minutes.

5. *Army Clerical Speed Test, ACS-1 (PRT 686) and ACS-2 (PRT 690).* This test consists of two parts, both highly speeded and administered with separate time limits:

(a) In Part I, Number Reversal (125 items) each item consists of two numbers. There are two alternative responses to indicate whether or not the second number is exactly the reverse of the first. The time limit is 5 minutes.

(b) In Part II, Coding (100 items), there is a key containing 10 words. Each word in the key has a number that is associated with it. Each item presents a word followed by the 10 alternative numbered responses in the key. The time limit is 5 minutes.

6. *Army Radio Code Aptitude Test, ARC-1 (PRT 78).* This is an auditory test, recorded on four phonograph records which include directions for the examinees. The first part of the test is composed of 270 learning exercises which are designed to teach the examinee the code signals for the three letters I, N, and T. These items are presented at approximately 4 to 7 words per minute. Immediately after the learning exercises, a test of 150 items is given to measure how accurately the three code signals can be recognized at varying speeds. The first 75 items are presented at approximately 15 words per minute, and the second 75 at approximately 21 words per minute. Responses are recorded on machine-scorable answer sheets presenting the three alternatives for each item.

7. *Shop Mechanics Test, SM-1 (PRT 476) and SM-2 (PRT 477).* In this test each item presents a drawing illustrating some mechanical principle or tool usage, followed by a four-alternative question. There are 40 items; the time limit is 15 minutes.

8. *Automotive Information, AI-1 (PRT 468) and AI-2 (PRT 469).* In this test each item is a four-alternative question about the identification or operation of automobile parts. Many items are based on pictures or diagrams. There are 40 items; the time limit is 15 minutes.

9. *Electrical Information Test, EI-1 (PRT 691) and EI-2 (PRT 692).* In this test each item is a four-alternative question on some element of electrical information. Many items are based on pictures or schematic diagrams. There are 40 items; the time limit is 15 minutes.

10. *Radio Information Test, RI-1 (PRT 693) and RI-2 (PRT 694).* In this test each item is a four-alternative question on some aspect of radio information. Some items are based on

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schematic diagrams. There are 40 items; the time limit is 15 minutes.

TECHNICAL DATA ON THE ARMY TESTS

Inasmuch as the AGCT is no longer in use, it will not be discussed here.

Armed Forces Qualification Test (AFQT)

The correlation between the equivalent Forms 1 and 2, when taken on the same day, is about 0.90.[2] The correlation between Forms 3 and 4 is 0.93. Forms 1 and 2 correlated with Forms 3 and 4 about 0.85.[3]

The great advantage of the AFQT is that all members of the armed services take it. However, it is rather difficult to use the AFQT for the assessment of premorbid intelligence since it is not easy to obtain the AFQT score for many enlisted men. These scores are not regularly entered on Form 20. (Form 20 will always be found in the Record Jacket.) Instead, they are entered on DD Form 47 for inductees and DD Form 4 for enlistees. Since April 1956 these forms have been placed in the Record Jacket. Prior to April 1956, there was no requirement that the AFQT score be included in the Record Jacket. One copy of Form 47 is sent to the Surgeon General, Department of the Army, Washington 25, D. C., ATTN: MEDCS. It is held there for about a year and then stored in Alexandria, Va. (Unfortunately, Form 47 is filed by place and date of induction rather than alphabetically or by Army Serial Number.)

There are other difficulties in using the AFQT. It cannot be readministered to an enlisted man without permission from the Adjutant General. No test-retest studies have been made where the time interval between test and retest was longer than a few days. Only a single score is available; *i. e.*, there is no way to measure differential deficit. For these reasons and others we have turned to the ACB as a means of assessing mental deficit due to illness.

Army Classification Battery (ACB)

The ACB, when properly weighted, usually can predict performance at various Army Schools (Radio, Mechanics, et cetera) with an average validity of about 0.6. Correlations with actual performance in the field run somewhat lower. The ACB intercorrelations are given in table 1.[4]

Frequently, the clinical psychologist or medical officer is asked whether the patient's abilities are so impaired that he cannot be returned to his former duty. Theoretically, the ACB scores made by a patient following illness could be used to help determine whether the patient could be returned to duty.

TABLE 1. *Median intercorrelations of the Army Classification Battery Tests**

	RV	AR	PA	MA	ACS	ARC	SM	AI	EI	RI
RV	1.0	0.68	0.55	0.50	0.50	0.40	0.60	0.40	0.45	0.25
AR	0.68	1.0	0.60	0.55	0.50	0.45	0.60	0.45	0.50	0.30
PA	0.55	0.60	1.0	0.50	0.50	0.40	0.50	0.40	0.45	0.25
MA	0.50	0.55	0.50	1.0	0.45	0.35	0.70	0.60	0.50	0.30
ACS	0.50	0.50	0.50	0.45	1.0	0.45	0.45	0.25	0.30	0.20
ARC	0.40	0.45	0.40	0.35	0.45	1.0	0.30	0.25	0.35	0.25
SM	0.60	0.60	0.50	0.70	0.45	0.30	1.0	0.65	0.58	0.35
AI	0.40	0.45	0.40	0.60	0.25	0.25	0.65	1.0	0.50	0.30
EI	0.45	0.50	0.45	0.50	0.30	0.35	0.58	0.50	1.0	0.50
RI	0.25	0.30	0.25	0.30	0.20	0.25	0.35	0.30	0.50	1.0

*This standard table of intercorrelations was developed from five large samples of enlisted men available by 1951. (Numbers in the samples ranged from 500 to 3,561.) All values are rounded to the nearest 0.05 except for two high coefficients where rounding off in either direction would distort the results.[2]

In this article only the first five tests (RV, AR, PA, MA, ACS) of the ACB are considered. There are a number of reasons for so doing: (1) Time limitations. It takes a little more than two and one-half hours to administer just the first five tests. (2) The first five tests are aptitude measures, whereas the last five are much more measures of achievement or skill. (3) The scores for the last five tests are sometimes missing from Form 20.

Table 2 presents some preliminary test-retest data for two control groups on the first five tests of the ACB. Samples were drawn from Ft. Meade, Md., and from the patient detachment at Walter Reed Army Hospital.

The Ft. Meade sample consisted of all the enlisted men available for testing in a medical training unit. The age ranged from 18 to 44; years of education, from 6 to 20; The rank, from private to master sergeant. The test-retest time ranged from 20 weeks to 403 weeks.

The Walter Reed Army Hospital controls were a sample of enlisted patients from which all psychiatric patients and patients having a diagnosis of brain damage were excluded. Years of education ranged from 5 to 18; rank, from private to master sergeant; and age, from 18 to 41 years. The distribution of elapsed time between test and retest was similar to that of the Ft. Meade sample, being 30 to 390 weeks. In table 2, the retest mean, $\overline{X}_2$, for both control groups is slightly higher than the original mean, $\overline{X}_1$. $\overline{D}$ is the average increase from $\overline{X}_1$ to $\overline{X}_2$. There is a minimum increase of about 1 point, apparently due to

practice effect and the learning that occurs in an Army environment.

TABLE 2. *Test-retest data on the Army Classification Battery*

Test	$\bar{X}_1$	$\bar{X}_2$	s_1^2	s_2^2	r_{12}	$\bar{D}$	s_d
Ft. Meade Medical Detachment N = 54							
RV	93	98	504	425	0.80	5	14
AR	89	91	488	596	0.84	2	13
PA	94	98	449	448	0.70	4	16
MA	94	99	336	356	0.81	5	11
ACS	86	88	385	320	0.76	2	13
Walter Reed Hospital Controls N = 47							
RV	99	100	328	426	0.69	1	15
AR	96	97	377	409	0.75	1	14
PA	97	101	539	398	0.66	4	18
MA	100	103	290	327	0.78	3	12
ACS	86	90	364	361	0.70	4	15

Theoretically, the variance (s^2) of each test should equal 400 since the hypothetical standard deviation is 20. The observed range is from a variance of 290 ($s \doteq 17$) to a variance of 596 ($s \doteq 25$). This seems to be within the variation expected from random sampling. The median test-retest correlation is about 0.75 with the hospital sample having somewhat lower correlations than the Ft. Meade group.

One question often raised is whether ACB scores are reliable enough to be worth using. Apparently, in some cases the ACB is administered to subjects who have been subjected to a fair amount of stress; sleep loss, hunger, fatigue, et cetera. However, the median test-retest correlation of 0.75 over a period of several years is about as good as can be expected of any group mental test.

There is good internal evidence that, whatever the initial testing conditions may have been, the error variance was not seriously increased. The retest, X_2, was administered to subjects who, so far as we know, were not suffering from hunger, sleep loss, fatigue, et cetera. If X_1 were full of errors due to stress, then s_1^2 should be much greater than s_2^2. Inspection of table 2 shows no such consistent difference. As a matter of fact, there is little evidence in the literature that sleep deprivation or fatigue (in the amount usually encountered) have much influence on intelligence test scores.[5]

If the data in table 2 were truly representative of the Army population, how could they be used to assess the mental deficit due to brain injury or mental illness? How much must an ACB score drop (assuming adequate motivation) before there can be good evidence of mental deficit?

Let us assume that we have an ACB test where the mean of X_1 is 100, the mean of X_2 is 101, the standard deviations are each 20, and the test-retest correlation is 0.70. Maximum sensitivity can be obtained by using the usual prediction equation

$$\hat{X}_2 = a + bX_1$$

where $\hat{X}_2$ is the predicted retest score,

X_1 is the first test score,

$$b = r_{12}\frac{\sigma_2}{\sigma_1},$$

and $$a = \bar{X}_2 - b\bar{X}_1.$$

In this case, $\hat{X}_2 = 31 + 0.7X_1$. The error of prediction, $X_{2\cdot1}$, will equal $X_2 - \hat{X}_2$; *i. e.*, $X_2 - 31 - 0.7X_1$. The standard deviation of the error of prediction is $\sigma_2\sqrt{1-r_{12}^2}$ which here equals about 14. If $X_{2\cdot1}$ is negative, this suggests mental deficit. The significance of $X_{2\cdot1}$ can be assessed by dividing it by its standard deviation. That is, the standard score

$$z = \frac{X_{2\cdot1}}{\sigma_{2\cdot1}} = \frac{X_2 - a - bX_1}{\sigma_2\sqrt{1-r_{12}^2}} = \frac{X_2 - 31 - 0.7X_1}{14}.$$

Since our interest is confined to mental deficit, a one-tailed test should be used. Then a z of -1.645 is necessary for the judgment of mental deficit to be significant at the 5 per cent confidence level. In our example, this means that $X_{2\cdot1}$ would have to be about -23. (The difference $X_2 - X_1$ can be used to assess mental deficit, but it is not as sensitive as the error of prediction.)

The data presented here are tentative. Before such a procedure can be used with confidence, it will be necessary to expand the sample of test-retest data considerably. It is not clear, for example, how the test-retest correlation varies as a function of time between test and retest. If there is systematic variation, it will be necessary to obtain samples stratified with respect to (1) age at time of first test, and (2) time between test and retest.

It is usually easy to obtain ACB test scores for enlisted men, because the scores are recorded on Form 20. This form accompanies the enlisted man throughout his career in the Army. However, the retesting of Army enlisted men presents practical

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TABLE 3. *Intercorrelations of Wechsler-Bellevue and Army Classification Battery**

	ACB Correlations			Mean	s
	RV	AR	PA		
WB** verbal weighted	81	79	60	42.21	12.70
WB performance weighted	60	64	64	49.19	13.01
WB total weighted	77	78	81	91.40	23.46
WB information	76	71	63	8.43	3.07
WB comprehension	58	56	37	9.50	2.84
WB digit span	50	49	33	7.19	3.12
WB arithmetic	63	70	51	8.47	4.41
WB similarities	65	60	48	8.96	2.90
WB vocabulary	76	70	55	8.05	2.72
WB picture arrangement	52	56	55	9.77	3.34
WB picture completion	51	54	54	9.42	3.60
WB block design	50	56	58	10.45	3.08
WB object assembly	35	39	48	10.66	2.94
WB digit symbol	54	51	42	8.73	3.06
Army RV	1.00	82	63	92.63	21.69
Army AR	82	1.00	73	89.80	22.02
Army PA	63	73	1.00	92.18	20.81

*Decimals omitted before correlations.
**WB = Wechsler-Bellevue

TABLE 4. *Approximate intelligence level equivalents*

Category	Terman-Merrill	Wechsler-Bellevue I. Q.	Percentile score AFQT	AGCT and ACB score	Army mental grade
Defective	69 and under	65 and under			
Borderline	70-79	66-79	0-9	0-73	V
Dull	80-89	80-91	10-30	74-89	IV
Normal	90-109	92-115	31-64	90-107	III
Bright	110-119	116-126	65-92	108-129	II
Superior	120 and above	127 and above	93 and above	130 and above	I

difficulties. The only individuals authorized by Army Regulations to administer the ACB are the Classification Officers stationed on each post. While it is possible to request the Classification Officer to perform the retesting, this would impose an additional workload not anticipated in usual Army situations.

We were granted permission by The Adjutant General to use the ACB for research purposes, provided the usual security precautions were maintained. Presumably, it would be possible for commissioned clinical psychologists (MOS 2232) to request special permission from The Adjutant General. It is also possible that an equivalent form of the ACB could be prepared in co-operation with the Personnel Research Branch (Office of the Adjutant General) for the special use of clinical psychologists.

COMPARISON OF ACB WITH WECHSLER-BELLEVUE (W-B, FORM 1)

One of us (E. K. M.) administered the W-B, Form 1, to 100 recruits, ages 20 to 24, at the Ft. Sam Houston Reception Center. Table 3 gives the correlations that were obtained between the W-B and the first three tests of the ACB. From table 3 it can be seen that RV, AR, and PA can be predicted with a validity of about 0.80.

For the convenience of those individuals who are more accustomed to the usual clinical I. Q. tests than to the Army standard scores and percentiles, approximate equivalence levels have been given in table 4. Table 4 is *not* based on a sample of subjects who have taken all five tests. It has been deduced from the standardization data available on each test. It is impossible, on the basis of the standardization data, to make any exact transformation of the clinical I. Q.'s into the Army standard scores and percentiles. For this reason, table 4 is not a reliable basis for assessing mental deficit.

If there were data on the correlations between the ACB and the W-B where a year or more elapsed before the W-B was given, then the same error-of-prediction technic described previously for the ACB could be used to assess mental deficit. In order to use the W-B in the same way as we recommended for the retest ACB, it would be necessary to have large samples stratified by age at time of ACB test and by time interval between ACB and W-B.

We are continuing to gather ACB retest data on patients and controls. It is hoped that enough data can be gathered so that adequate norms can be published for the use of the Army Medical Service.

ACKNOWLEDGMENT. Our thanks are due to Dr. Hubert E. Brogden and Dr. John P. Mundy of the Personnel Research Branch, TAGO, who helped assemble some of these data.

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WHAT PRICE FOR TRANQUILITY?

"The effects of tranquilizing drugs have been studied in 8,200 patients in whom anxiety was the normal chief finding. The group was limited to people of normal physical make-up and of at least average intellectual capacity who were capable of working steadily and were complaining of tension, worry, and associated physiological disturbances. Of these, 7,500 had taken some amount of the tranquilizing drugs before they came under observation. The danger to the patient's physical health is shown by the appearance of allergic phenomena in 96, general toxic effects in 78, habituation in 72, severe liver disturbances in 31, other severe symptoms in 97, and death in 4. Two of the deaths were suicides. The danger to the patient's emotional health is shown by the finding of about 1,700 instances in which serious problems were created in essentially normal people and 827 instances in which emotional illness was aggravated. The danger to the physician results from the accumulating pressure on the medical profession from the people who produce and those who demand these drugs. There is, fourthly, a grave danger to society in the idea that tensions should be reduced by techniques of relaxation and administration of drugs rather than by the constructive effort required for satisfying needs and removing dangers. The physician must inform himself well about these drugs and reorient his own thinking about their indications and limitations."

—HERMAN A. DICKEL, M. D.
HENRY H. DIXON, M. D.
in *Journal of the American Medical Association,* p. 422, Feb. 9, 1957

ARMY MOBILE DENTAL CLINICS

HAROLD G. OTT, *Colonel, DC, USA*

CULMINATING several years of planning and effort by the United States Army, the first of 12 dental operating vans designed to serve Army Antiaircraft Command (ARAACOM) personnel at isolated locations throughout the United States was placed in operation in the Second Army area at Lordstown Military Reservation, Warren, Ohio, on 8 February 1957. This mobile dental clinic (fig. 1) will eventually serve NIKE missile units in the Cleveland, Ohio, area as well as its parent station.

Figure 1.

Other vans will be located within Second Army at South Park Military Reservation, Pittsburgh, Pa., to serve the Pittsburgh defense area; Philadelphia Quartermaster Depot for the Philadelphia area; and at Fort George G. Meade, Md., for the Baltimore area. Another will serve the Washington, D. C., area under the jurisdiction of the Military District of Washington. Identical vans

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From Headquarters Second Army, Fort George G. Meade, Md.

are being furnished other Continental United States (CONUS) Armies as follows: First Army, 2; Fifth Army, 2; and Sixth Army, 3.

Officially listed as Dental Operating Clinic, Semitrailer Mounted: Two Chair, these vans have been developed to provide service and facilities comparable to that of fixed installations (fig. 2). As the name implies, these 30-foot vans are completely equipped with standard dental chairs, units, cabinets, and all accessory items so that two dental officers or an officer and a dental hygienist can be simultaneously employed. Other features include dental roentgenographic equipment, a combination laboratory and dark room, and airconditioning. Although self-contained, the vans are equipped with utility outlets, including telephone, in order that they may operate either independently or from outside electrical and water-supply sources.

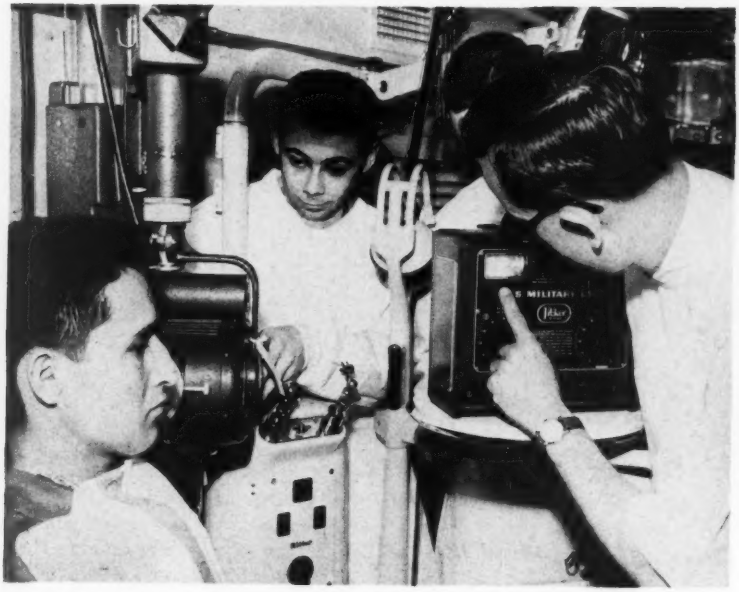

Figure 2.

As previously stated, the mission of these mobile clinics is to provide on-site service to remotely located units. The heretofore widely dispersed location of most NIKE missile sites has required personnel to travel great distances and be absent from their place of duty for prolonged periods, in order to obtain dental care at a fixed facility.

Assigned to the installation having primary responsibility for the dental care of antiaircraft artillery personnel in each of the major defense areas in the Second Army, it is planned to have the vans visit each site on a regularly scheduled itinerary. Visits of 10-day to 2-week duration will enable the dental surgeon to conduct a dental survey at the site and apportion his time and efforts accordingly. Cases requiring extensive or complicated treatment beyond the capabilities of the mobile facility will be referred to a fixed installation for such care. Depending on the number of sites to be served in a particular area, the results of dental surveys, and other factors, it is estimated that return visits can be made on an average of every 3 or 4 months.

The availability of these mobile clinics satisfies a long-standing need and enables the Army Dental Corps to better fulfill its role and mission as a part of the Army Medical Service.

THOROUGHNESS

"No quality in the practicing physician is more important than thoroughness. With it, a clear mind can become great, a mediocre one, expert. Without thoroughness, inexcusable errors are certain to occur during the professional lifetime of a doctor. Painstaking thoroughness in the daily routine of work is a distinguishing characteristic of the scientist. It is a habit of mind, difficult for some to acquire, easy for others—absolutely essential for the successful care of medical patients."

—EDITORIAL
in *GP*
p. 70, Sept. 1956

CASE REPORTS

TORSION OF THE APPENDIX TESTIS

HERBERT S. FRIEDMAN, *Captain, USAF (MC)*

THE most consistent vestigial organs found on the testes are the appendixes testis and epididymis derived respectively from the cranial ends of the Müllerian duct and mesonephric collecting tubules.[1] The frequency with which these structures occur are demonstrated by the findings of Sundarasivarao[2] who reported that on 152 testes examined, 122 were found to have an appendix testis and 35 an appendix epididymis. Only 21 specimens had neither, and only 6 subjects had neither vestige bilaterally.

The only pathologic condition affecting these structures primarily is torsion. This was described by Ombredanne[3] in 1913 and since then has been shown to be a not uncommon occurrence as evidenced by the number of reported cases appearing in the medical literature. Scott[4] collected 85 reported cases including one of his own in 1940. Seidel and Yeaw[5] found 14 other cases and added 8 of his own to bring the total to 107. Since then there have been numerous case reports appearing in the American medical literature.[6-10]

The cause of the torsion is unknown, and the condition has occurred in undescended as well as in descended testes, with no known increase in frequency in the former. It has been found in a 4½-month-old infant as well as in a 39-year-old man. The age group of most common occurrence is 10 to 14 years. The ordinary clinical picture is acute onset of pain in one testis, sometimes associated with a sudden movement. Swelling of the testis on the affected side along with edema and erythema of the overlying scrotal skin soon occurs. There are very few systemic symptoms and little if any fever. Palpation of the testis, where this is permissible, demonstrates a tender nodule either attached to or immediately anterior to the globus major of the epididymis. This may be differentiated from acute epididymitis by the acute onset, absence of urinary symptoms, negative findings upon examination of the prostate, and tenderness at the upper rather than the lower pole of the testis. Torsion of the spermatic cord may be differentiated from torsion of the appendix testis by the fact that in the latter the symptoms are less severe and there is a tender nodule at the upper pole of

From U. S. Air Force Hospital, Lowry Air Force Base, Colo.

the testis. An exception to this is the one case reported by Vermeulen and Hagerty[6] in which the patient, a 10-year-old boy, was acutely ill and tenderness precluded careful palpation of the testis until after he was anesthetized, at which time a movable mass attached to the upper pole of the testis was palpable.

The treatment of choice is surgical excision of the twisted appendix. Seidel[5] reported one case which responded to conservative therapy, but it is generally concluded that surgery shortens the period of morbidity.

I have treated three patients diagnosed as having torsion of the appendix testis. Two were treated conservatively, and the diagnosis was consequently confirmed by surgery in only one case.

CASE REPORTS

Case 1. A 10-year-old boy was seen in the urology clinic at this hospital on 13 August 1956 with a history of having developed sudden pain in the right scrotum and inguinal region one week prior to that time. Since then the pain had been intermittent, aggravated by walking, and apparently relieved by sitting or lying still. There were no systemic symptoms, and his appetite was good. There had been no contact with mumps. Urinary symptoms were denied. There was no previous history of genito-urinary complaints, except that both testes tended to retract into the inguinal canal, though they would descend to the scrotum when he sat in a warm tub.

Examination revealed an obese male in no apparent distress. Adduction of the right thigh was noted while walking, but no discomfort was noted while sitting or lying still. Temperature was 99.4°F orally. Physical examination was negative, except for marked edema and erythema of the right hemiscrotum, exquisite tenderness over the scrotum and right inguinal region, and the presence of both testes at a level just below the external inguinal ring. Because of the tenderness, neither testis could be pushed into the scrotum. The white blood cell count was 11,000 per μl with a differential count of 70 per cent neutrophils, 25 per cent lymphocytes, 1 per cent monocytes, and 4 per cent eosinophils.

The patient was treated conservatively for one day with no appreciable diminution of symptoms, and consequently surgical exploration of the right testis was performed with a preoperative diagnosis of torsion of the spermatic cord. The tunica vaginalis contained approximately 10 ml of clear yellow fluid. The testis and epididymis appeared normal, but attached to the superior pole of the testis, immediately anterior to the globus major of the epididymis was a dark-red, soft structure 1 cm in diameter. This was on a short pedicle, apparently twisted counterclockwise. The lesion and the tunica vaginalis were excised, the incision closed with drainage, and the patient discharged from the hospital on the second postoperative

day. When seen one week postoperatively, the incision was well healed and no edema of the testis was present.

Pathologist's Report

The specimen submitted consisted of a rounded piece of tissue measuring 1 by 1 by 0.3 cm. The tissue was smooth and soft. The color varied from dark red to dark blue. Cut sections presented a smooth, glistening, dark-red, slightly bulging surface.

The sections showed a piece of loose connective tissue, rich in blood vessels and lined by one layer of columnar ciliated epithelium.

The connective tissue was diffusely infiltrated by inflammatory cells, predominantly polymorphonuclear-like leukocytes. The blood vessels were distended. Areas of extravasated blood were present within the stroma. There were no epithelial inclusions in the stroma of the specimen. No thrombosed blood vessels and no areas of necrosis were present (figs. 1 and 2).

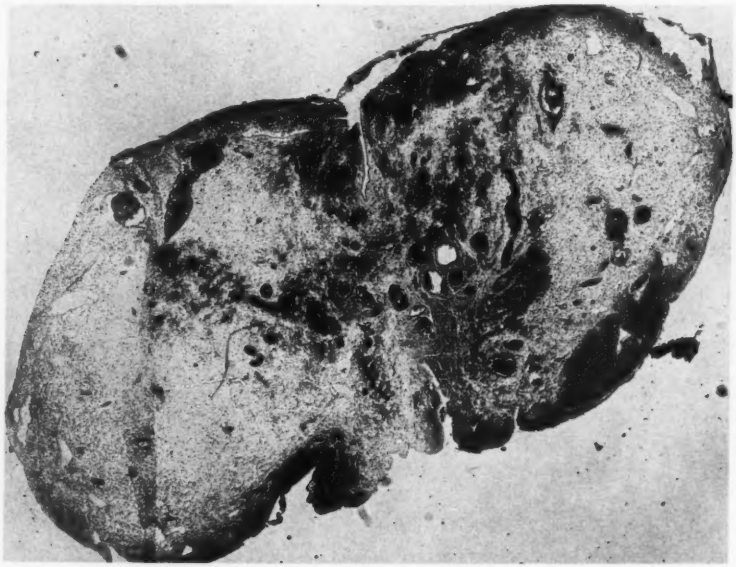

Figure 1. Section through entire appendix testis showing severe congestion and hemorrhage in the loose connective tissue stroma. Epithelial cells surround the specimen. There are no epithelial cell inclusions in the stroma. (48-mm Microtessar, hematoxylin-eosin stain.)

Diagnosis: Appendix testis; inflammation, acute; hyperemia; hemorrhage.

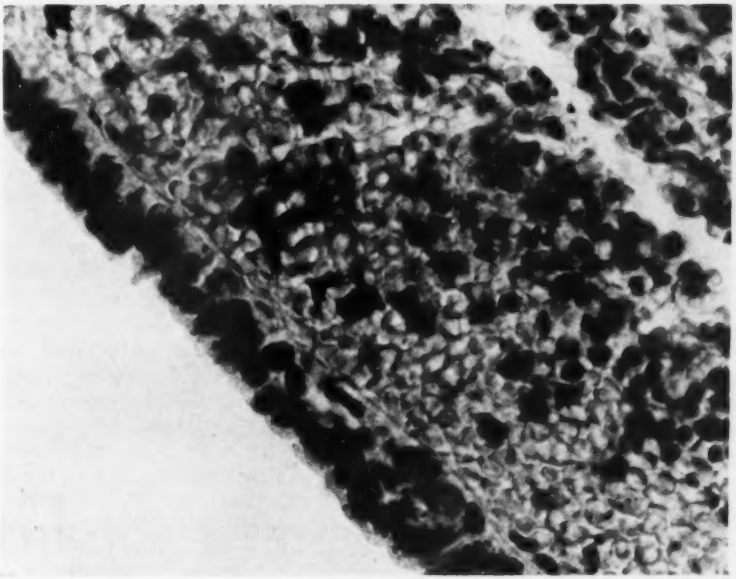

Figure 2. Epithelial lining consists of tall columnar ciliated cells. (× 675, hematoxylin-eosin stain)

Case 2. A 24-year-old man was admitted to the hospital on 29 May 1956 with the complaint of pain at the superior pole of the right testis for three days. He had previously been told that he had a small cyst on the upper pole of the right testis which had always been asymptomatic. The structure was now quite tender, though no other abnormal physical findings were present. He was treated conservatively and discharged asymptomatic on 31 May.

Case 3. A 24-year-old airman was seen in the urology outpatient clinic with the complaint of pain in the right testis which had occurred suddenly two days before. The day following the onset of the pain he had taken several APC tablets which afforded no relief. There was no history of trauma, and no previous similar pains had occurred. He had no urinary symptoms or any systemic symptoms. Examination revealed mild tenderness of the right testis. The epididymis was normal. There was an exquisitely tender nodule, about 1 cm in diameter, attached to the superior pole of the right testis, just anterior to the head of the epididymis. He was treated with ice packs and scrotal support and became asymptomatic in two days.

COMMENTS

The first of the patients presented was proved by surgical exploration to have torsion of the appendix testis. Though the preoperative diagnosis was torsion of the spermatic cord, the

correct diagnosis could have been made by the mildness of the symptoms, particularly since they had been present for one week, even though careful palpation of the testis was precluded by the severe tenderness present. The remarkable response to surgical intervention certainly could not have been anticipated with conservative therapy. The diagnosis in the other two cases, though not proved surgically, was confirmed by the limitation of the findings to the appendix testis in both instances. The latter two cases may have represented partial torsion of the body or instances in which the appendix untwisted spontaneously. Their response to conservative therapy was certainly adequate enough to preclude any thought of surgical treatment. They indicate, however, that torsion of the appendix testis may be much more common than previously suspected. With this in mind, it would probably be advisable to excise any of these vestigial organs seen at times when operative procedures on the testis for other reasons, *e. g.*, hydrocelectomy or orchiopexy, are performed.

SUMMARY

Three cases of torsion of the appendix testis, one proved by surgical exploration, are presented.

It is suggested that the incidence of this pathologic condition may be much more common than heretofore suspected, and that many of the milder cases may respond well to conservative therapy.

ACKNOWLEDGMENT: I should like to thank Dr. Bernard Czernobilsky, Chief of Pathology, of this hospital, for the preparation and description of the pathologic material.

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Pulmonary Amebiasis

Combined Resection and Medical Therapy

MILAN L. BRANDON, *Lieutenant, MC, USNR*
H. LEONARD JONES, *Captain, MC, USN*
HORACE D. WARDEN, *Captain, MC, USN*

As a result of modern therapy the morbidity of amebiasis has been significantly decreased. There are many amebicides for intestinal amebiasis; chloroquine phosphate, quinacrine hydrochloride, and emetine hydrochloride are useful for hepatic amebiasis, and antibiotics are particularly useful for secondary bacterial invasion. There is little indication, however, of significant progress in lowering the mortality rate of amebiasis.[1] The rapid strides in chemotherapy have tended to obscure the indications for surgery, especially in hepatic and pleuropulmonary amebiasis. Some cases are resistant to drug therapy and, in addition to simple drainage, there are other surgical procedures which are now available and applicable in certain instances.

The diagnosis of pulmonary amebiasis is frequently difficult or is often unsuspected.[1] Due to the increasing trend to resect suppurative pulmonary lesions, the diagnosis of amebiasis is established occasionally only after thoracotomy.[2] The following is a report of a case of pulmonary amebiasis, diagnosed at surgery and treated by pulmonary resection and drug therapy.

CASE REPORT

A 36-year-old Negro veteran was admitted to this hospital 26 October 1956 with complaints of cough and right posterolateral pleuritic chest pain of two months' duration. He had increased fatigability, anorexia, and had lost 40 pounds. Initially, the cough produced small amounts of clear mucoid sputum, but during the second month there were frequent paroxysms of cough which produced blood-streaked sputum. He had felt feverish but had no chills. He had no gastro-intestinal complaints.

Past history revealed that he had lived in Massachusetts, Louisiana, and Georgia, had traveled throughout the world from 1943 through 1946. He was given antimalarial therapy in the Philippines in 1944. He had smoked from 10 to 15 cigarettes per day for 15 years. Family history and systemic review were noncontributory.

From U. S. Naval Hospital, San Diego, Calif.

On examination the patient appeared emaciated and he coughed frequently. His blood pressure was 120/70 mm Hg; pulse rate, 100 per minute; respiration, 18; and temperature, 100.4° F. There was an irregular enlargement of the right first costochondral junction. He had clubbing of the fingers. The right lung was dull to percussion at the base, with diminished breath sounds and tactile fremitus, but with no other definite signs of fluid. Medium to coarse moist inspiratory rales were present throughout the right lung. No abnormalities of the abdomen were noticed on examination.

Examination of the blood showed an initial hemoglobin of 10.7 grams per 100 ml; hematocrit, 35 ml per 100 ml; white blood cell count, 24,600 per μl, with moderate shift to the left; normal electrolytes, negative sickle cell preparation, and the serologic tests for syphilis were negative. Sulfobromophthalein sodium retention was 1.5 per cent in 45 minutes. His urine was normal. An initial sputum culture was positive for *Diplococcus pneumoniae,* which was sensitive to the antibiotics being used in his treatment. Sputum smears and cultures, and urine cultures for acid-fast bacilli were negative. The tuberculin skin test was positive, histoplasmin skin test was 4 plus positive, and the coccidioidin skin test was negative.

On admission, roentgenograms of the chest showed a density in the right apex, and a rounded, fairly homogenous soft tissue density without cavitation occupying the major part of the right lower lobe, as well as pleural thickening and/or fluid in the anterior costophrenic sinus. Plain roentgenograms of the abdomen showed no abnormalities. Treatment was begun immediately with 250 mg oxytetracycline four times daily. Fever persisted at 100° to 101° F, and penicillin and streptomycin sulfate were started on the 5th hospital day. Rales persisted at the right lung base, and tenderness and fullness were noted at the right costal margin, but the liver edge could not be palpated or percussed. Roentgenograms of the chest on the 7th day were unchanged. Fever subsided on the 10th day, but only for a few days. Cough was nonproductive, persistent, and associated with pleuritic pain. Roentgenograms of the spine, ribs, and skull showed no evidence of metastatic disease. Tomograms of the chest on the 12th day showed a large lymph node in the region of the bifurcation of the right main-stem bronchus, and a 9- by 8-cm soft tissue density in the right base with some constriction and irregularity of the right inferior bronchus. Bronchoscopy on the 14th day showed some injection of the mucosa of the right lower lobe bronchus with moderately thick mucoid secretions loaded with coccoid bacteria; Papanicolaou smear was negative. Complaints and findings persisted. Roentgenograms of the chest on the 25th day showed the density in the right base to have diminished slightly in extent and a faint circular area of radiolucency, indicating either resolution of consolidation or possible cavitary change.

On the 26th day exploratory thoracotomy revealed acute and chronic inflammation in the right lower lobe, including many old and recent pleural adhesions, and a large thick-walled abscess involving the

basilar segments of the right lower lobe which communicated in the shape of an hourglass through a 3-mm defect in the diaphragm with a 3-cm subphrenic abscess cavity containing purulent material. An old granulomatous infiltrate in the apical segment of the upper lobe was left intact. Resection of the right lower lobe basilar segments, and external drainage was accomplished. Before the patient left the operating room, histologic examination of a smear from the abscess wall stained with MIF (Merthiolate-iodine-formaldehyde)[3] revealed trophozoites of *Entamoeba histolytica* (fig. 1). Histologic examination of the abscess wall after formalin preparation showed necrotic lung tissue containing *E. histolytica* trophozoites. Cultures and smears for acid-fast bacilli, fungi, and bacteria were all negative.

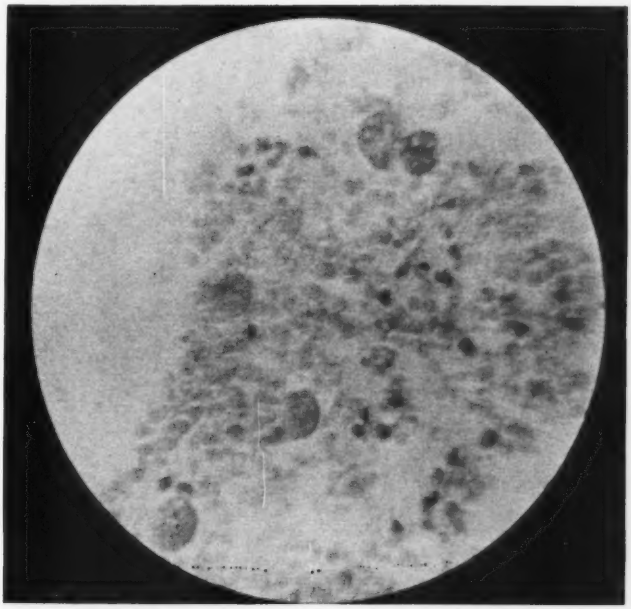

Figure 1. Smear from wall of lung abscess revealed trophozoites of Entamoeba histolytica *and established the diagnosis of amebiasis. (MIF stain)*

Chloroquine phosphate (1.0 gram daily for 2 days, then 0.5 grams daily for 18 days) and emetine (0.06 gram daily for 6 days) were started without delay. Serial electrocardiograms taken while the patient was receiving emetine, were all normal. Following the course of emetine, 0.21 gram of Diodoquin (brand of diiodohydroxyquin) three times a day was given for 18 days. Chloroquine was restarted on the 45th day, 1 gram daily for 2 days, then 0.5 gram daily for 10 days. Oxytetracycline was discontinued and the drainage tubes were removed on the 33d day, or 1 week after surgery, when he was afebrile. Peni-

cillin and streptomycin sulfate were discontinued 3 weeks later. He remained afebrile and essentially asymptomatic. Roentgenograms of the chest showed some postoperative reaction in the right hemithorax, which cleared gradually after removal of the drainage tubes.

Proctoscopy on the 55th day, or 5th week postoperatively, revealed hyperemia, petechiae, and multiple small 2- to 3-mm ulcerations of the sigmoid colon, and amebic cysts were identified on smear stained with MIF (fig. 2). No abnormalities were seen on examination with a barium enema. A third chloroquine course was administered, and 0.25 gram of carbarsone twice daily, for 10 days was added. Small ulcerations of the sigmoid were still present, but appeared to be granulating in well when the drugs were discontinued. Vioform (brand of iodochlorhydroxyquin), 250 mg three times daily for 14 days, was then administered. Subsequent examinations and studies were normal, and there was only residual scarring evident in the roentgenograms of the chest.

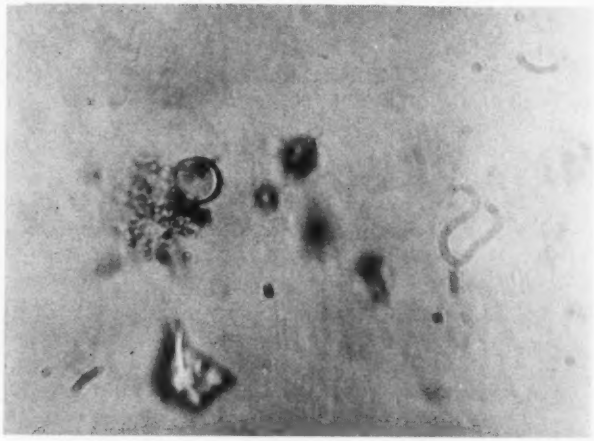

Figure 2. Amebic cysts identified in smear from ulceration of sigmoid colon. (MIF stain)

DISCUSSION

Amebic pleuropulmonary involvement is secondary to amebiasis elsewhere and is generally the result of direct extension of hepatic amebiasis through the diaphragm into the lung, bronchus, or pleura, resulting in lung abscess, bronchopleural fistula, or empyema. In a recent report of 148 fatal cases of amebiasis from the Armed Forces Institute of Pathology, amebic liver abscess was present in 61 per cent of the patients, and 41 abscesses were ruptured.[1] Of the abscesses that ruptured, 22 extended into the lung. In 18 patients with liver abscess there were no detectable intestinal lesions; in 3 of these there was extension

into the lung. Amebiasis was correctly diagnosed ante mortem in only one third of all the cases, and liver abscesses were missed clinically in one half of 90 patients in whom the lesion was present.

It, therefore, was not surprising to have met such diagnostic difficulties in our patient, the most disturbing of which were (1) initial positive cultures of *D. pneumoniae;* (2) roentgenographic evidence of right apical lung density; (3) positive reactions to tuberculin and histoplasmin skin tests; (4) lack of clinical or roentgenographic signs of right pleural effusion; (5) no evidence of cavitation in roentgenograms of the chest, and only the barest suspicion of this on tomograms; (6) lack of typical appearance of lesion and abscess contents at operation; and (7) absence of gastro-intestinal complaints. Thus, it was important to consider an amebic origin in pleuropulmonary suppuration and to search immediately for amebas at thoracotomy, in order to institute prompt antiamebic therapy, without waiting for the processing of sections.

In 1943, Ochsner and DeBakey[4] concluded that surgery offered little in the treatment of pleuropulmonary amebiasis, because the mortality of open drainage alone was 48.2 per cent; of open drainage plus emetine, 16.6 per cent; and with emetine alone it was only 5.4 per cent in their series. Advances in chemotherapy and improvement in surgical technic have made operative procedures other than simple external drainage practical and applicable in certain instances. Shaw[2] reported a case of chronic amebic pleuritis and pneumonitis in a patient whom he operated upon electively because of lack of response of the infection to antiamebic drugs and thoracenteses. He stated that when pleuropulmonary complications of amebic hepatic abscess do occur, surgical intervention may be necessary to (1) eliminate a persistent fistulous channel between the bile duct system and bronchus, (2) remove damaged pulmonary tissue that produces a continued moribund state, and (3) decorticate the lung and diaphragm in empyema when the lung cannot be re-expanded by repeated aspirations.

In suspected pleuropulmonary complications of amebic hepatic abscess, Ochsner and DeBakey[5] pointed out that the prognosis is not as good in those with a small or absent communication between a bronchus and an area of marked lung reaction, as in those with a large communication which permits rapid evacuation. When there is no communication with a bronchus the cough will tend to be nonproductive and amebas will be absent in the sputum. The diagnosis will be difficult to establish and the course will simulate a primary bacterial or fungus infection, or a malignant neoplasm with secondary infection. In such a case the diagnosis may be established only at thoracotomy, as in our patient. This

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is the third patient in whom pulmonary amebiasis was successfully treated by pulmonary resection combined with antibiotics, chloroquine, and emetine. It is noteworthy that no failures with such combined treatment have been reported in the available literature. It would, therefore, appear that this type of surgical procedure together with vigorous antiamebic drug therapy might reasonably be expected to improve the prognosis of advanced pulmonary amebiasis.

SUMMARY

An unusual case of amebic lung abscess is reported, which (1) presented exceptionally difficult diagnostic features and (2) was treated successfully with segmental resection combined with emetine, three courses of chloroquine and other amebicides, as well as antibiotics. This is the third reported case of a patient with pulmonary amebiasis treated in this manner. By removing the products of infection as completely as possible, it is our belief that this form of surgical intervention combined with vigorous multiple drug therapy will further lower morbidity and mortality in advanced pulmonary amebiasis.

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Fracture Following Corticotropin Therapy

WALLIS L. CRADDOCK, *Lieutenant Colonel, MC, USAR*

ALL of the many available preparations of corticosteroids and corticotropin (ACTH) are capable of causing complications involving bone. Apparently none is safer than the others. The first report of pathologic changes in bone following the use of these drugs was in 1950.[1] In the two cases described, osteoporosis of rheumatoid arthritis was a contributory factor in producing fractures. In one of these cases, a 70-year old woman suffered fracture of the right femoral neck with pronounced displacement after 34 days of cortisone therapy. Extreme osteoporosis at the fracture site was noted when open surgical reduction was attempted.

Demartini, Grokoest, and Ragan[2] in 1952 reported a series of five patients with rheumatoid arthritis, all of whom were predisposed to osteoporosis prior to hormone treatment. Following therapy with cortisone they developed compression fractures of the lower dorsal and lumbar spines. These patients were female, four of them postmenopausal, and their physicial activity was limited. Subsequent reports have indicated that intensive and prolonged use of the hormones is a prerequisite for osteoporotic changes, but that these changes are not a rare complication of such therapy.[3,4,5]

Osteoporosis with vertebral fractures is a clinical feature of Cushing's syndrome in over 80 per cent of cases.[6,7] Becks and sociates[8,9] demonstrated that ACTH tends to retard chondrogenesis and osteogenesis in normal rats, accounting for the irregular arrangement of bony trabeculae, as well as irregular cartilage columns in the erosion zones. Blunt and co-workers[10] studied the effect of cortisone on the responses of the connective tissues to trauma. The reparative process remained sluggish after the fourth postfracture day, with relatively little tissue differentiation, and there was only minimal healing between the ends of the fractured bone. The intercellular matrix appeared quite irregular in structure. Fibroblasts appeared abnormal with bizarre arrangements of nuclear chromatin.

From Outpatient Clinic, Veterans Administration Regional Office, 1750 S. Redwood Rd., Salt Lake City, Utah.

It was concluded that (1) the blood supply might be inadequate due to dearth of new blood vessels with insufficient nutrition of tissue, or that (2) through the few new blood vessels which did penetrate the area, a material, perhaps cortisone itself, was transported which inhibited growth and development of connective tissue. At any rate, the primary disturbance is lack of bone matrix formation due to deficiency in protein metabolism. The osteoporosis produced by cortisone and ACTH therapy should not be confused with osteomalacia, where the primary disturbance is demineralization of bone, or with parathyroid disease, where the disturbance is destruction of bone.

More recently, vertebral fractures after use of corticosteroids have been reported in younger males. One interesting report describes the occurrence of fractures of the spine in a 9-year-old boy being treated for Still's disease.[11]

To ensure earliest possible detection of osteoporosis, urinary calcium excretion studies should be performed serially on patients who are receiving corticosteroids and ACTH. A value above 150 mg per day points to a negative calcium balance.[12] Such a calcium excretion may indicate loss of bone mass. Periodic roentgenograms of the spine also serve as guides in predicting vertebral fractures.

Post-mortem findings in cases of hormone-induced osteoporosis with pathologic fractures have been well documented. Although the osteoporotic changes have a predilection for the lumbodorsal spine and pelvic bones, similar changes have been observed in the knee, ankle, and subastragalar joints.[13] In addition to the marked bone deformity, the overlying cartilage may deteriorate rapidly and prominent secondary hypertrophic changes may appear about the joint margins. Microscopic examination of the softened vertebrae reveals few bony trabeculae, no evidence of osteoid activity, and little osteoblastic or osteoclastic activity. Fractures of ribs are repaired by large quantities of poorly ossified cartilage.

It has been suggested that continous action of the depository type of ACTH (ACTH gel) is responsible for changes in bone, whereas when the drug is administered interruptedly (intravenously) osteoporosis does not occur. The assumption has been made that with the older types of treatment the adrenal gland had some chance to recover its function between injections.[14]

The bone damage caused by cortisone and ACTH appears to be irreversible, despite the use of estrogens and testosterone. Once this condition appears, only conservative measures of treatment are of any help. To forestall the development of aseptic necrosis or Charcot-like changes in weight-bearing joints, "patients can be warned to avoid weight-bearing as much as possible, to use crutches and canes to support already damaged joints, and, thus, to extend the usefulness of joints."[13]

Discontinuation of maintenance therapy presents difficulties, in that symptoms of cortisone withdrawal and an exacerbation of the underlying disease may occur.

The following case report illustrates the problem encountered during maintenance ACTH therapy even when none of the contributory conditions causing pathologic changes in bone are present prior to prolonged hormone therapy.

CASE REPORT

A 43-year-old white male veteran had been treated for neurodermatitis since 1945; otherwise he was in excellent health. All attempts to control this patient's condition failed until October 1952, when startling improvement occurred three to four days after intravenous infusions of ACTH were begun. Since 1953 (for over three years), he had been taking ACTH gel. He had always been able to get the drug despite frequent warnings of possible complications. There were transient features resembling a Cushing syndrome at times, but these cleared rapidly when ACTH was discontinued for a short time. It was impossible to determine the total amount of corticotropin the patient had taken during the period of four years. Whenever he was hospitalized and the drug withdrawn, reactions resembling those described as the "cortisone withdrawal syndrome" were noted.

During hospitalization in August 1954 roentgenograms of the spine and pelvis showed no abnormalities. He avoided further hospitalization until April 1956 because physicians were reluctant to continue the ACTH. Physical findings were within normal limits, despite the fact that the patient used crutches. His urine, blood urea nitrogen, serum calcium and phosphorus, serum proteins, fasting blood glucose, serum alkaline and acid phosphatase, carbon dioxide combining power of the blood, and various serum electrolytes were normal. Roentgenograms of the skull and chest showed normal findings. Roentgenograms of the lower spine and pelvis revealed marked osteoporosis, slightly misshapen femoral heads, and greatly thickened femoral necks indicative of possible aseptic necrosis of the heads of the femurs.

Following the hospitalization he received ACTH gel from various physicians prior to reporting to the outpatient clinic of this facility in September 1956. There were no significant changes in his physical status since his last hospitalization although his height is about 2 inches less than that recorded several years ago. He shows no definite changes indicative of Cushing's syndrome. He now uses crutches constantly, but appears to be in no great pain. In fact, he is usually quite jovial, at times rather euphoric, steadily praising the benefits he receives from ACTH and meprobamate (Equanil). He is rather caustic in his expressions regarding physicians who would discontinue the ACTH gel.

Recent roentgenograms of the chest and skull showed no abnormalities. There were pronounced compression changes of the weight-

bearing aspect of each femoral head, with a lateral concave depression on each side to accommodate the outer lip of the acetabulum. These changes suggested absorption and marked softening of the bone (fig. 1). Definite osteoporotic changes were seen in the head of the left humerus and shafts of both femurs, tibias, and fibulas (fig. 2). There was considerable compression and anterior spreading of the fifth lumbar vertebral body (fig. 3).

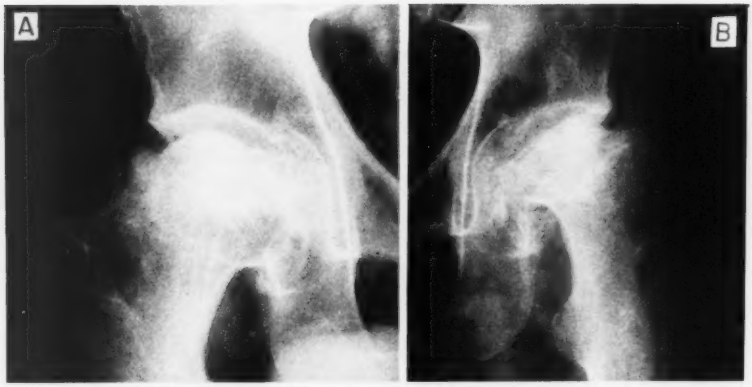

Figure 1. Roentgenograms of pelvis showing pronounced compression changes of the head of each femur, with concave depression laterally on each side to accommodate the outer lip of the acetabulum. (A) *Right side.* (B) *Left side.*

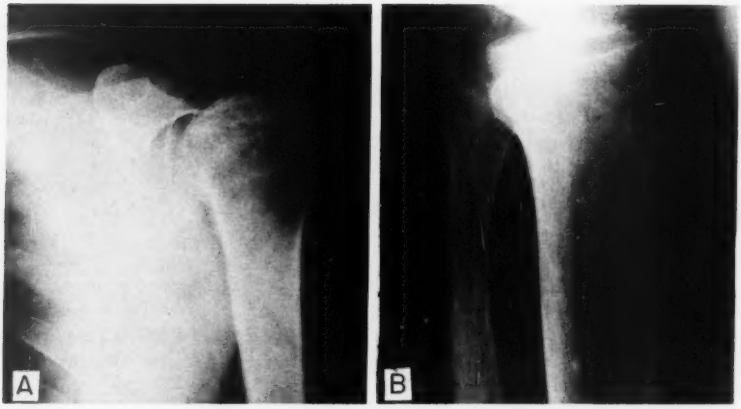

Figure 2. Osteoporosis of long bones due to ACTH gel. (A) *Left humerus.* (B) *Shafts of tibia and fibula, right.*

Figure 3. Vertebral fracture from corticotropin therapy. Considerable compression and anterior spreading of the 5th lumbar vertebral body is shown.

Blood chemical and other laboratory tests have remained in normal ranges except for a persistently increased urinary excretion of calcium.

SUMMARY AND CONCLUSIONS

Because of the potential dangerous side effects of ACTH and the adrenocorticosteroids the decision to use or not to use any of these agents must be made for each patient. The effects of newer drugs are often deprecated, but it would appear that these hormones are but newer forms of symptomatic therapy in many disease states. The physician must weigh any possible benefits of the drugs against the serious bone complications being reported at an alarming rate.

Postmenopausal women should probably not be given the hormones even if roentgenograms of their vertebrae show little evidence of osteoporosis. Serial determinations of urinary calcium excretion and periodic roentgenograms of the spine are indicated if the drugs are to be used over six months. If the hip has been affected, a roentgenographic appearance suggesting aseptic necrosis or Charcot-like deterioration of weight-bearing joints may be observed. The most likely cause of this complication

is the greatly increased use to which patients submit joints already damaged by rheumatoid arthritis. Although massive degenerative changes usually occur in weight-bearing joints, they may be quite generalized.

In most of the reported cases of severe osteoporosis caused by these hormones the well-known predisposing factors of advanced age, menopause, and restriction of activity were present. The drugs were given for rheumatoid arthritis in most cases. In those showing femoral fractures, osteoporosis was demonstrated in pretreatment roentgenograms, and these occurred in postmenopausal women. However, the case reported vividly documents the severe complications from prolonged hormone therapy in a 43-year-old man who was in good physical health prior to maintenance therapy with ACTH gel. The case illustrates the dilemma physicians must face in this ever-growing problem, and that the hormones must not be given indiscriminately.

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Acute Puerperal Inversion of the Uterus

JACK E. BYRD, *Lieutenant Commander, MC, USN*
WILLIAM S. BAKER, Jr., *Captain, MC, USN*

ACUTE puerperal inversion of the uterus was recognized as a distinct pathologic entity in the earliest medical writings.[1-3] The exact incidence is not known, but has been reported as 1 in 16,420 deliveries.[4]

The symptoms of acute inversion most often tabulated include shock, hemorrhage,[5] pain, and a mass in the vagina. Other signs or symptoms are fundal dimpling or cupping,[6] abdominal pain, retention or incontinence of urine, dysuria, or uremia.[1,7] When shock occurs, it is more severe than in any other condition in obstetrics and is completely out of proportion to the amount of blood lost.[4]

Almost all possible causes have at some time or other been reported as a reason for puerperal inversion.[8,9] The most frequently mentioned are mismanagement of the third stage of labor[10,11] and conditions producing spontaneous inversion of the uterus.[6,12-16] The advocated methods of management[5,7,9,14-23] are as diverse as are all other phases of this condition, but the majority of authorities favor immediate replacement of the inverted corpus.

CASE REPORT

An 18-year-old woman, gravida 1, para 0, was admitted to this hospital on 11 January 1952. The fetal membranes had been ruptured for two hours. There were no contractions or bloody show on admission. The patient had been followed in the prenatal clinic for the last two months of her prenatal course, which had been essentially normal. Her last menstrual period was 5 April 1951, and estimated date of confinement was 12 January 1952. Her total weight gain during this pregnancy was 14 pounds, and she had no albuminuria or hypertension. Her hemoglobin on 26 January was 10.5 grams per 100 ml and blood type was A, Rh positive. A serologic test for syphilis was negative, her urine was normal, and roentgenograms of the chest showed no abnormalities.

From U. S. Naval Hospital, Camp Lejeune, N. C. Both authors are now assigned to U. S. Naval Hospital, San Diego, Calif.

Physical examination on admission revealed a normal young woman in impending labor with a blood pressure of 120/72 mm Hg. The uterus was enlarged to term. Fetal heart tones, heard in the left lower quadrant, were 140 per minute. The vertex was presenting in the left occiput anterior position. On rectal examination the cervix was estimated to be 50 per cent effaced and not dilated.

The patient began having contractions at 0430 hours on the day of admission. During labor she received 200 mg of Seconal (brand of secobarbital) and 200 mg of Demerol (brand of meperidine hydrochloride). Under saddle block anesthesia she was delivered at 1108 of a full-term female infant in good condition (weighing 5 lb 15 oz). Low forceps were used. Seven minutes after delivery the placenta became visible at the introitus, and with moderate traction on the cord the placenta was delivered. It was attached to the fundus and the uterus was completely inverted. An intravenous infusion of 5 per cent dextrose in distilled water was started immediately and preparations were made for infusion of whole blood. Blood pressure at that time was 110/70 mm Hg. The placenta was removed intact from the fundus; the membranes were removed in fragments. The uterus was then replaced immediately with pressure from below by the physician's hand in the vagina. The uterus gradually returned to its normal position. This was accomplished by pressure and massage from below in the axis of the superior strait and by massage of the fundus externally until the dimpling was no longer present. A fist was kept in the uterus until normal contraction had taken place in response to 1 ml (10 units) of Pitocin (brand of oxytocin) intramuscularly and 1 ml (0.2 mg) of Ergotrate Maleate (brand of ergonovine maleate) intravenously. The patient received 1,000 ml of 5 per cent dextrose in distilled water in the delivery room. Blood transfusion was deemed unnecessary. Blood pressure stabilized at 124/72 mm Hg. A right mesiolateral episiotomy was repaired immediately with No. 00 chromic catgut and the patient was returned to the recovery room in good condition, with a firm symmetrical fundus and no evidence of active bleeding. Total blood loss was estimated to be 450 milliliters.

The patient was given 300,000 units of procaine penicillin G twice daily, and 0.25 ml of Pitocin every 4 hours for 6 doses, and another 1,000 ml of 5 per cent dextrose in distilled water after reaching the recovery room. Hemoglobin on the day after delivery was 10 grams per 100 ml and the hematocrit was 36. The patient progressed well until the second postpartum day when her temperature spiked to 101°F at 0600, accompanied by some uterine tenderness, but the lochia appeared normal. The uterus was firm and symmetrical, and Homans' sign was negative. She was given Chloromycetin (brand of chloramphenicol), 500 mg every six hours. Her temperature rose again to 101°F at 1800 hours that evening and then returned to normal for the rest of the postpartum course. The remainder of her hospital stay was uneventful.

She was ambulatory on the morning of the third day and was discharged in good condition on the fifth postpartum day. There was no recurrence of bleeding or dimpling of the uterus during her hospital course.

The patient was well on 28 February, when she was seen for a six weeks' postpartum examination. She had a slight erosion of the cervix. The fundus was well involuted, symmetrical, anterior, and normal in size and configuration. She was seen on 10 April at which time a pelvic examination showed normal findings. She had had a normal menstrual period of four days beginning on 23 March.

The following day a hysterosalpingogram using Priodax (brand of iodoalphionic acid) as a radiopaque media showed a normal configuration of the uterine cavity and tubes with spillage into the peritoneum. There was a questionable loss of the normal uterine fundal concavity, which may indicate an inherent muscular defect in the fundus.

DISCUSSION

As in all diseases and pathologic conditions, primary emphasis should be on prevention, when causative factors are known.[24-26] There is nothing mysterious about the cause of acute inversion of the puerperal uterus. The basic dynamics are simple. Any hollow elastic organ that is open at one end and is supported to some degree in one plane or another can be invaginated, ultimately to complete inversion, if a force of sufficient magnitude to overcome inertia and elastic resistance is applied at the proper time and in a proper direction. Whether or not the reduced elastic resistance in uterine inversion is atony, thinning at the placental site, or congenital malformation is of little importance, for the end result is the same. In the same respect, the force necessary to overcome this elastic resistance (whether it is increased intra-abdominal pressure, excessive downward pressure on the uterus in expressing the placenta, or excessive traction on the umbilical cord in completing the third stage) is important only insofar as the operator prevents such a force from being applied, or properly applies an opposing force should inversion occur spontaneously.

More women die from accidents during the third stage of labor than during the other two stages combined. At the conclusion of the second stage, if the child has been delivered slowly, the uterus will normally have contracted as the infant is removed. If delivery is too rapid or atony from any cause exists, there will remain a large balloonlike cavity and the predisposing condition for inversion is present, only awaiting the application of the necessary force to set the process in motion.

We believe that inspection of the vagina and cervix is a necessary routine and that exploration of the uterus should be done without hesitation if any undue bleeding or shock occurs. We do

not hesitate in any emergency to use type O, Rh-negative blood which has not been cross matched, but has Witebsky's substances added. We do not consider that it is exercising undue caution to routinely start an infusion of 5 per cent dextrose in water in all cases of complicated labor or in which we anticipate trouble.

We firmly believe that immediate replacement of an acutely inverted uterus is essential, and that many times this can be done prior to the onset of shock. Simultaneously, assistants should be administering supportive care. The uterus should be replaced gently but firmly, and the procedure should be a simple reversal of the inverting mechanism as described by Barrett.[6] When the replacement has been completed, the hand in the uterus should be extended to the upper limits of the fundus and held there until an oxytocic substance can take effect. Any massage should be upward, and at no time should the uterus be squeezed. As the uterine musculature responds to the oxytocic agent, the operator should slowly withdraw his hand as it is forced from the uterine cavity. The patient should be closely observed in the immediate postpartum period and Pitocin administered in a constant intravenous drip, using 10 units of the substance in 1,000 ml of 5 per cent dextrose in distilled water. The blood bank should have 1,500 ml of compatible whole blood available during the patient's hospital stay. A wide-spectrum antibiotic should be given to the patient to prevent sepsis.

Using epinephrine and deep anesthesia to aid relaxation, we would not hesitate to attempt reposition of the uterus even when a contraction ring is present. Manual removal of the placenta before or after reposition would depend on individual circumstances. If operative intervention were unavoidable, we would first attempt the Spinelli vaginal approach. If this failed, the Haultain abdominal method would be performed.

SUMMARY

Acute puerperal inversion of the uterus may be either spontaneous or caused by mismanagement of the third stage of labor. Predisposing factors include atony of the uterine muscle, thinning at the placental site, and congenital malformation. Particularly in the presence of such factors, any force such as increased intra-abdominal pressure, excessive downward pressure on the uterus in expressing the placenta, or excessive traction on the umbilical cord may be sufficient to overcome the inertia and elastic resistance of the uterus, and produce inversion.

Immediate, gentle manual replacement of the uterus is essential in the treatment of this condition. The operator's hand should be maintained in the uterine cavity until an oxytocic substance can be given and take effect, and until the hand is gradually forced from the cavity.

The case reported in this article demonstrates that prompt, adequate treatment may prevent serious complications in this emergency.

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A MESSAGE FROM THE A. M. A.

Last month's article outlined the comprehensive American Medical Association study project on medical professional liability. In particular, it dealt with malpractice claims involving medical officers or federally employed physicians.

This month's Message concerns state legislative proposals as they pertain to medical professional liability. State laws are applicable in malpractice suits against civilian physicians while, as pointed out in the preceding Message, the Federal Tort Claims Act is applicable to claims involving military physicians. Although there have been isolated efforts to enact state legislation relating specifically to actions against physicians, relatively few laws have been enacted that would place physicians in a more vulnerable position than other tort defendants.

An unsuccessful proposal in Montana in 1951, for example, would have made malpractice a felony. It is fortunate that the Montana proposal failed of enactment, even though it did go on to provide that nothing therein should be construed to prohibit a physician or surgeon from administering medicine or otherwise treating patients in cases where the effect of the medicine or treatment might be dangerous to life or injurious, but where the administration thereof is in accordance with sound, approved medical practice. Undoubtedly, many new practitioners would have been scared away from Montana if that legislation had been enacted. It would probably have caused physicians in Montana to hesitate a long time before using some of the newer drugs, treatments, or technics.

A Kansas law, although relating only to patients in state hospitals who receive psychiatric shock treatments, went to the opposite extreme by denying a cause of action against the physician unless he has been guilty of gross negligence.

Georgia law provides that a physician must bring to the exercise of his profession a reasonable degree of care and skill. It appears that this type of approach is best in the long run for both patient and physician. It doesn't require the physician to

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense. —*Editor.*

be a miracle man, nor does it require the patient to establish a practically impossible degree of proof.

There have been suggestions as to the need of "modernizing and reforming" the general law applicable to personal injury cases. For example, some states, through court decisions, have applied the doctrine of Comparative Negligence or the doctrine of Last Clear Chance. Usually, at common law, if the plaintiff by his own negligence contributes in any way to the injuries which he receives, he is denied a recovery from the defendant. This is the doctrine of Contributory Negligence and, if applicable and established, is a valid and complete defense in a negligence action. Many have contended that where the degree of contributory negligence is minute as compared with that of the defendant, a complete denial of recovery is neither fair nor reasonable. It has been further argued that where a defendant has the last opportunity to avoid an accident, even though there was some negligence on the plaintiff's part in placing himself in a hazardous position, the defendant should be held responsible for the resulting injuries. These arguments make considerable sense and have, in fact, resulted in the enactment of state laws establishing that point of view. One of the most recent of such laws was enacted in Massachusetts in 1954.

As to the question of burden of proof, it has been well established that as a general rule medical expert testimony is necessary to explain to a jury the standard of care required in a particular case, because logically a lay jury is held to be incapable of determining such a standard by itself. An unsuccessful proposal in Vermont would have changed that rule by providing that it would not be necessary in malpractice actions for the plaintiff to introduce expert testimony to establish a standard of care and skill for the purpose of showing the failure of defendant to observe such care. Another general rule of law provides that textbooks may not be admitted in evidence to establish the truth of statements found therein because of the fact that the author is not present and subject to cross examination. However, both Massachusetts and Nevada have enacted laws permitting the introduction of such evidence. The Massachusetts statute requires that, not less than three days before the trial, notice must be given the adverse party of such intention stating the name of the writer of the statement and the title of the treatise, periodical, book, or pamphlet in which it is contained.

Under the doctrine of *res ipsa loquitur* (the thing speaks for itself) it is not necessary to introduce expert testimony in those cases of accident or injury which clearly could not have happened unless someone was negligent. The mere showing of the

circumstances of the accident is sufficient to establish a prima-facie case. Under such a presumption of fact, the jury may infer that the accident or injury resulted as a consequence of negligence. An example would be where, following an operation, a sponge was left in the patient's abdomen.

In some cases of malpractice where the plaintiff was unable to obtain medical witnesses, the courts have gone too far in converting the doctrine of *res ipsa loquitur* into a rule of sympathy. It is entirely possible that should the courts believe there still remain valid and legitimate cases in which plaintiffs are unable to persuade reputable practitioners to testify in their behalf, the state legislatures will be requested to solve the problem. Maybe this attitude should serve as a warning to those members of the medical profession who are unobtainable as expert medical witnesses for the plaintiff.

DEATHS

BROWN, Dale Eugene, First Lieutenant, MSC, USAR, of Culver, Ind.; stationed at 63d Medical Detachment, Germany; graduated in 1950 from Indiana University, Bloomington, Ind.; commissioned a Second Lieutenant in the United States Army Reserve 21 September 1951; died 4 April 1957, age 30, in Germany, as result of a vehicle accident.

MADEROS, Luis Orlando, Major, MC, USAR, of Augusta, Ga.; stationed at U. S. Army Hospital, Fort Gordon, Ga.; graduated in 1942 from the University of Havana Medical School, Havana, Cuba; commissioned a Major in the U. S. Army Reserve 3 February 1956; died 15 March 1957, age 39, near Augusta, Ga., due to an automobile accident.

SULLIVAN, Meddie Charles, Captain, MSC, USAR, of Laurel, Miss.; stationed at 28th Field Hospital, Fort Bragg, N. C.; appointed a Flight Officer in the Army of the United States 10 November 1942 and a Second Lieutenant in the National Guard of the United States 6 January 1949; commissioned a First Lieutenant in the Army of the United States 11 June 1951; died 9 March 1957, age 35, near Fayetteville, N. C., due to an aircraft accident.

SECRETARY GENERAL OF WORLD MEDICAL ASSOCIATION VISITS RANDOLPH AIR FORCE BASE

Doctor Louis H. Bauer, Secretary General of the World Medical Association and past President of the American Medical Association, recently visited the School of Aviation Medicine, Randolph Air Force Base, Tex., and addressed the student officers. The photograph shows Doctor Bauer with Major General Otis O. Benson, Jr., Commandant of the School. Dr. Bauer himself was Commandant of the School after World War I, and is at present a member of the Board of Visitors, Air University, of which the School of Aviation Medicine is a part. He is a founder of the Aero Medical Association and Editor Emeritus of its journal, *The Journal of Aviation Medicine.*

General Benson, recently advanced to the two-star rank, has had a distinguished career in aviation medicine. Presently assigned as Commandant of the School of Aviation Medicine for the second time in his career, he has, like Dr. Bauer, been the recipient of the John Jeffries Award of the Institute of Aeronautical Sciences and the Theodore C. Lyster Award of the Aero Medical Association. He was awarded an honorary Doctor of Science degree from the University of Montana in 1955. General Benson is Vice Chairman for Aviation Medicine of the American Board of Preventive Medicine.

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ASSISTANT SECRETARY OF DEFENSE VISITS MILITARY AVIATION MEDICAL FACILITIES

During the first week in April, the Honorable Frank B. Berry, Assistant Secretary of Defense (Health and Medical), was accompanied by guests from the Department of National Defence of Canada and by members of his own Civilian Health and Medical Advisory Council on an orientation visit to several military aviation centers in Alabama and Florida.

Arrival at Forrest Sherman Field of Honorable Frank B. Berry, Assistant Secretary of Defense (Health and Medical), with members of the Department of Defense Civilian Health and Medical Council and medical personnel of the Canadian Department of National Defence.

Distinguished Canadian guests included Dr. J. A. MacFarlane, Chairman, Canadian Forces Medical Council; Brigadier K. A. Hunter, Coordinator, Medical Services, Department of National Defence; Air Commodore A. A. G. Corbet, Director General of Medical Services, Royal Canadian Air Force; Dr. R. Ian Macdonald, Consultant in Medicine to the Canadian Forces Medical Council; and Wing Commander J. C. Wickett, Royal Canadian Air Force Medical Liaison Officer, Canadian Joint Staff, Washington.

Others accompanying Dr. Berry were Dr. E. H. Cushing, Deputy Assistant Secretary of Defense (Health and Medical); Dr. Melvin A. Casberg, Vice President, Medical Affairs, University of Texas; Dr. Thomas P. Fox, Professor of Oral Surgery, Jefferson Medical School; Dr. Anthony J. J. Rourke, Hospital Consultant, New Rochelle, N. Y.;

Dr. James E. McCormack, Assistant Vice President, Presbyterian Hospital, New York City; Dr. Wilbert C. Davison, Dean, Medical School, Duke University; Surgeon Commander Frank P. Ellis, Her Majesty's Royal Navy; and Mrs. Mildred L. McBlair, Executive Assistant to Dr. Berry.

At the Headquarters Air University, Maxwell Air Force Base, the group was briefed on the missions of the Air War College, the Air Command and Staff College, the Air Force Institute of Technology, and the Air Force Reserve Officers Training Corps. The group also visited the 3810th U. S. Air Force Hospital.

Dr. Berry being greeted at Eglin Air Force Base by Major General Robert W. Burns, Commander of the Air Proving Ground Command; Colonel Charles H. Morhouse, Commander of the 3201st U. S. Air Force Hospital; and Colonel Frank H. Mears, Commander of Eglin Air Force Base.

At nearby Gunter Air Force Base, there was a comprehensive briefing on the Gunter Branch of the School of Aviation Medicine, U. S. Air Force Air University, followed by a tour of many of the classrooms and laboratories.

At the Headquarters, Naval Air Training Command, Naval Air Station, Pensacola, the group was briefed both on Naval Air Basic Training and on the training and research activities of the School of Aviation Medicine. Tours were made of all the School facilities. The group also visited the U. S. Naval Hospital, Pensacola, where Dr. Berry met with the hospital staff.

The fourth visit of Dr. Berry's party was to Eglin Air Force Base, where they inspected the facilities of the 3201st U. S. Air Force Hospital, with an explanation of the mission of the Air Proving Ground.

MILITARY SURGEONS CONVENTION CHAIRMEN ANNOUNCED

Committee chairmen for the 64th annual convention of the Association of Military Surgeons of the United States, which will be held at the Hotel Statler in Washington, D. C., 28-30 October 1957, have been announced by the association President, Colonel Amos R. Koontz, MC, Maryland National Guard. They are: General Chairman, Major General Paul I. Robinson, MC, USA, Director, Office for Dependents' Medical Care; Program Chairman, Colonel Robert C. Kimberly, MC, Maryland National Guard; Scientific Exhibits, Captain William M. Silliphant, MC, USN, Director, Armed Forces Institute of Pathology; and Commercial Exhibits, Mr. Steven K. Herlitz, New York City.

The new General Chairman, Major General Paul I. Robinson, MC, USA.

Membership in the Association is open to all present and former officers of the Medical, Dental, Veterinary, Medical Service, Nurse, and Medical Specialist Corps of the Army, Navy, and Air Force, as well as personnel from the Public Health Service and Veterans Administration.

Each year the convention draws some 2,000 members from all parts of the Nation, as well as leading medical members of military organizations from other countries. The theme of the 64th annual convention will be "Professional Excellence—the Criterion of Military Medicine."

INTERNATIONAL NAVAL REVIEW

An International Naval Review, the first staged in this country since 1907, will be held on 12 or 13 June in Hampton Roads, Va., in connection with the celebration of the anniversary of the first permanent settlement by English-speaking colonists in the United States, at Jamestown, Va.

This full-dress review is expected to be the largest ever held anywhere, with 27 nations invited to send ships to Hampton Roads for the occasion. The nations participating will be those who have some reason to take part in celebrating the founding of Jamestown and the colonization of North America.

BOOKS

Reviews of Recent Books

DORLAND'S ILLUSTRATED MEDICAL DICTIONARY, Including Modern Drugs and Dosage, by *Austin Smith*, C. M., M. D., and Fundamentals of Medical Etymology, by *Lloyd W. Daly*, A. M., Ph. D. Editorial Board: *Leslie Brainerd Arey*, Ph. D., Sc. D., LL. D.; *William Burrows*, Ph. D.; *J. P. Greenhill*, M. D.; and *Richard M. Hewitt*, A. M., M. D. Philological Consultants: *Paul J. Alexander*, Ph. D., and *Harry C. Messenger*, M. D. 23d edition. 1,598 pages; more than 700 illustrations and 50 plates. W. B. Saunders Co., Philadelphia, Pa., 1957. Price $12.50.

This is an old friend and standby that fulfills its purpose of giving its users "an up-to-date medical dictionary, sufficiently full for the varied requirements of all classes of medical men." Appropriately, *The American Illustrated Medical Dictionary* has been renamed *Dorland's Illustrated Medical Dictionary*, in attune with the title by which it has been commonly known.

The page size of the Dictionary has been increased slightly to make possible the inclusion of thousands of new terms. Many definitions have been rewritten to keep pace with "changing concepts or expanded knowledge," and numerous typographic errors that appeared in the twenty-second edition have been corrected. The rewritten tables of the arteries, muscles, and nerves are based on material prepared under the sponsorship of the National Academy of Sciences and conform in part to the Nomina Anatomica as revised by the International Anatomical Nomenclature Committee. A welcome and useful new feature is "Notes on the Use of This Dictionary."

The typography is good. Phonetic respelling of main entries is as simple as possible and immediately follows the boldfaced entry.

All in all, this dictionary continues to live up to its wide reputation as a significant and essential desk reference for students, medical authors or editors, physicians, and others interested in medicine and allied fields.—*E. W. MARTIN*

THE UNITED STATES AIR FORCE DICTIONARY, edited by *Woodford Agee Heflin*. 578 pages. D. Van Nostrand Co., Inc., Princeton, N. J., 1957. Price $4.75.

Since the flight of the Wright brothers at Kitty Hawk in 1903, there has been a build-up of terminology that is peculiar to aeronautical sciences and allied disciplines. This terminology received its first momentum in World War I, while there was provided a tremendous impetus to this trend during World War II.

At first one might think that the language of airmen was jargon or slang which had little genuine application and could be hardly understood or deciphered. This work dispels that concept.

Of particular interest among the 16,000 entries are the authorized and unauthorized abbreviations and designations of the Air Force which have often confounded the average military reader. There are also listed meteorologic, navigational, electronics, and radar terms, which are in common usage today, but perhaps not always fully understood. In addition, many scientific and medical terms, some applicable to aviation medicine, are clearly defined.

It is of particular value and interest to those who are engaged in writing for official and nonofficial military publications. Perhaps this may be termed a dictionary of special vocabulary for certainly the vast majority of the terms cannot be found in Webster's. The book reflects fine workmanship of a large staff of interested editors, both civilian and military, at the Air University.

—PAUL V. DAVIS, Col., USAF (MC)

NOTES ON ATOMIC ENERGY FOR MEDICAL OFFICERS, by The Royal Naval Medical School, Alverstoke, Hampshire, England. 169 pages; illustrated. Philosophical Library, Inc., New York, N. Y., 1956. Price $4.75.

This small handbook, prepared by the Staff of the Royal Naval Medical School, provides basic information on the phenomenology of atomic explosions and of the consequences to man. Gamma radiation effects are dealt with mainly.

There are also brief chapters on atomic structure, nuclear physics, and monitoring instruments which serve as useful introductions to these subjects. The appendix includes the periodic table of elements, a short table of physical constants, and certain peacetime tolerances for radiation exposures.

The book will be of value to the medical officer desiring a simplified, yet concise account of atomic energy as it relates to military medicine.

—KENT T. WOODWARD, Maj., MC, USA

PHYSICAL EXAMINATION IN HEALTH AND DISEASE, by *Rudolph H. Kampmeier,* A. B., M. D. 774 pages; illustrated. 2d edition. F. A. Davis Co., Philadelphia, Pa. 1957. Price $9.50.

An organized and practical approach to physical examination—the original means of diagnosis—is used in this text.

As in the first edition, two chapters are devoted to each body region, the first dealing with normal findings, the second with abnormal and disease states. Anatomic, pathologic, and physiologic considerations are stressed. Each chapter is liberally supplied with illustrative photographs.

The entire opening chapter is devoted to history taking. There are no separate chapters on neurologic examinations, this part of the examination being included in the various chapters on separate regions of the body.

This book is well written and should prove of value both as a text for students and as a reference book in medical libraries.

—JULES J. McNERNEY, Lt. Col., MC, USA

GUIDE TO MEDICAL WRITING, A Practical Manual for Physicians, Dentists, Nurses, Pharmacists, by *Henry A. Davidson*, M. D. 338 pages; illustrated. The Ronald Press Co., New York, N. Y., 1957. Price $5.

Although many physicians, at one time or another, write professional articles, few are familiar with the requirements of good medical writing. The practitioner's energies are so largely consumed by his major work that he has little time or taste for the cultivation of skill in writing.

This guide is intended to help him develop such skills. It attempts to show the prospective author how to pin down his ideas, how to organize his subject matter, how to master the mechanics of presentation, and how to put it in readable form. Emphasis is placed on practical points—research methods, outlining, revision, summaries, the choice of vigorous words, and the arrangement of pictures and charts. In addition to advice on writing skills, the book covers the intricacies of punctuation, spelling, grammar, and bibliography. Particularly valuable for constant reference are the dosage conversion tables and lists of generic equivalents to the trade names of drugs.

One might suggest that a more complete breakdown of the text into headings of co-ordinate grade or superior and subordinate grades, and a more complete index would increase the effectiveness of the book as a ready reference. As an adjunct to other texts on the subject, however, this work certainly deserves shelf space in the library of anyone who attempts medical writing, particularly the novice.

—FRANKLIN M. ROBERTS, Lt., MC, USNR

THE CIBA COLLECTION OF MEDICAL ILLUSTRATIONS, Volume 3, A Compilation of Paintings on the Normal and Pathologic Anatomy of the DIGESTIVE SYSTEM. Part III, Liver, Biliary Tract and Pancreas. Prepared by *Frank H. Netter*, M. D. Edited by *Ernst Oppenheimer*, M. D. Five sections, XV to XIX. 165 pages; 133 colored plates. Publications Department, CIBA Pharmaceutical Products, Inc., Summit, N. J., 1957. Price $10.50.

Most practicing physicians are familiar with the colored plates on many systems and disease states distributed from time to time by CIBA. This volume is much more than merely a collection of those previously distributed booklets. It is a compilation of most aspects of the liver, pancreas, and biliary tree, including anatomy, physiology, biochemistry, diagnostic methods, and disease states, simplified to two-dimensional, multicolored plates which are easily understandable.

These interpretive visual demonstrations depict the newer concepts of liver structure, functional aspects as related to morphology, pathogenesis of hepatic and pancreatic disease, and refined discriminations of various entities.

For purposes of continuity the first section covers normal anatomy and the second, physiology and pathophysiology, including diagnostic tests. A full section is then devoted to each of the organs, namely, diseases of the liver, diseases of the gallbladder and bile ducts, and diseases of the pancreas.

Each group of plates is accompanied by a well-written discussion of the topic. An excellent bibliography, for reference for more complicated discussion of the subjects, is presented in the back of this book.

This volume is not a substitute for any one of the excellent textbooks on these organs, but is a supplement, leading to a clearer understanding of this complicated area of the human body. It should prove invaluable to the resident in internal medicine or surgery.

—LESTER P. POPE, Capt., MC, USN

THE YEAR BOOK OF DRUG THERAPY (1956-1957 Year Book Series), edited by *Harry Beckman*, M. D. 514 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $6.75.

A yearbook on drug therapy is most appropriate and necessary nowadays when there are many new chemicals and numerous trade names for similar products. A number of abstracts in this volume discuss unexpected and undesired reactions to therapy. This information is especially important, because while the new drugs have many advantages, their potentialities for harm are often equally great.

In this particular edition the choice of the articles is very good and there is a liberal sprinkling of editorial footnotes which adds to the interest and value of the book. This book is a valuable addition to any doctor's library, allowing rapid survey of articles on therapy from a great many more sources than most of us have time to examine.

—JAMES L. TOBIN, Col., USAF (MC)

PROCEEDINGS OF THE THIRD NATIONAL CANCER CONFERENCE, Detroit, Mich., June 4-6, 1956. Sponsored by American Cancer Society, Inc., and National Cancer Institute, U. S. Public Health Service. 961 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1957. Price $9.

This is a comprehensive and up-to-date review of the broad field of cancer and upholds the high standards achieved on the preceding conferences of 1949 and 1952. The cancer problem is covered from the broad aspects of epidemiology as a tool in research to detailed considerations of various neoplasms involving specific organs. It represents the combined efforts of over two hundred essayists and discussers who are recognized authorities in the fields of cancer research, diagnosis, prognosis, and treatment.

The first 13 pages are devoted to the opening remarks which clearly set forth the ideals and purpose of the conference and the summaries which are masterpiece condensations of the vast material contained in this volume. The second part consists of general lectures concerning the subjects of epidemiology, radiation neoplasia, virus etiology, chemical effects of growing tumors on the host with special reference to iron, factors influencing curability, and measurement of morbidity. The third part consists of symposiums and panels covering cancer of the breast, prostate, lung, head and neck, female genital tract, gastrointestinal tract, lymphomas and leukemias, and chemotherapy. The end results of treatment are covered in detail.

The American Cancer Society and the National Cancer Institute, co-sponsors of this book, deserve the highest commendation for this invaluable compilation of information on cancer.

—*FRANK M. TOWNSEND, Col., USAF (MC)*

CLINICAL UROLOGY FOR GENERAL PRACTICE, by *Justin J. Cordonnier*, M. D., F. A. C. S. 252 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $6.75.

In 233 pages of text the author has condensed all the urologic information which the intern or general practitioner will need; and, for the specialist, uropathy is outlined in such a succinct, factual manner as to make it a refreshing reference manual.

Diagnosis and treatment of the surgical diseases of the genitourinary tract are described briefly and in an up-to-date manner except for surgical technics. Pathology is illustrated by photomicrographs and roentgenograms of a size and detail rarely encountered today, and rivaled only in clarity by the refreshingly large textual print. The chapters are predicated on pathology, simply indexed, and followed by ample, current references which reflect the didactic approach of this noted professor.

Any urologist, perusing Dr. Cordonnier's book, might enviously utter, "I wish I had written that!"

—*CHARLES W. HOFFMAN, Jr., Lt. Col., MC, USA*

PRACTICAL DERMATOLOGY, by *Samuel M. Peck*, B. S., M. D., with *Laurence L. Palitz*, M. D., Ph. D. 380 pages; illustrated. Landsberger Medical Books, Inc. Distributed by The Blakiston Division, The McGraw-Hill Book Co., Inc., New York, N. Y., 1956. Price $7.

According to the preface, this book was written for the busy general practitioner. The first chapter is devoted to general remarks on diagnosis and treatment and is exceptionally well written. A discussion of industrial dermatoses is excellent and brief. The rest of the book is devoted to clinical dermatology. There are 122 black and white photographs. Several of these, although technically good, are not particularly illustrative of the designated disease.

Throughout the book, the authors stress the use of simple forms of treatment, such as the statement on page 24 that wet dressings or a soothing ointment will frequently do as well or better than expensive steroids. In general, they appear overoptimistic as to the results of treatment but do not overemphasize the use of x-ray and steroids.

The authors are to be commended for the briefness of their descriptions. However, in some diseases the discussions are so short that they lack clinical descriptions. The book is well-written, however, and can be recommended to the general practitioner.

—KARL V. KAESS, Capt., MC, USN

ALLERGIC DERMATOSES DUE TO PHYSICAL AGENTS, edited by *Rudolf L. Baer,* M. D. 110 pages; illustrated. Published by New York University Press. Distributed by J. B. Lippincott Co., Philadelphia, Pa., 1956. Price $3.

In this symposium on allergic dermatoses, the authors have, in a few pages, summarized what is presently known on the subject of physical dermatologic allergy. Included in the six chapters of this book is a discussion of the general treatment of allergic hypersensitivity to physical agents, including trauma, light, heat, and cold.

This little volume is primarily of interest to dermatologists and allergists and has its place in their libraries, as it is the only symposium entailing and correlating the various physical cutaneous sensitivities. Though the discussion of the various conditions is brief, the bibliography given at the end of each chapter is most adequate. This compendium is also of value to students of dermatology and allergy in preparing for their specialty boards.

—LOUIS S. LELAND, Col., MC, USA

MODERN OFFICE GYNECOLOGY, by *George Blinick,* M. D., F. A. C. S., and *Sherwin A. Kaufman,* M. D., F. A. C. S. 218 pages; 47 illustrations. Lea & Febiger, Philadelphia, Pa., 1957. Price $4.50.

A slightly different approach is used in this textbook. The first of three sections deals with the most common gynecologic complaints presented, such as abnormal vaginal bleeding, amenorrhea, dysmenorrhea, infertility, leukorrhea, and menopause. Under each heading a differential diagnosis is presented and one or two accepted forms of therapy are given.

The second section contains illustrations on the technics of performing bimanual pelvic examinations, biopsies, cauterizations, pessary insertions, contraceptive fittings, and taking smears. The diagrammatic drawings are in black and white. The cytology and gross pathology drawings contribute very little of value. The third section is really an amplification of the first in that it consists of a bibliography that covers the controversial issues of diagnosis and treatment that were outlined in part one. This bibliography is supplemented with clinical abstracts. Inpatient gynecologic treatment is not discussed.

Although this textbook would be of definite aid to the general practitioner and perhaps to the senior medical student and intern, it would be of limited value to the resident or gynecologist.

—*J. WILSON HUSTON, Capt., MC, USN*

CLINICAL UNIPOLAR ELECTROCARDIOGRAPHY, by *Bernard S. Lipman*, A. B., M. D., F. A. C. P., and *Edward Massie*, A. B., M. D., F. A. C. P. 3d edition. 397 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $7.50.

This book presents the complicated subject of electrocardiography in a simple and practicable manner, as free from detailed and complex discussions as possible. It is intended primarily for those not too experienced in electrocardiography. This edition maintains much the same format of the previous ones, with a short introduction including a history and description of the subject. The clinical aspects of electrocardiography, such as position of the heart, ventricular enlargement, bundle branch block and myocardial infarction, abnormal patterns, and congenital heart disease, are discussed. Following the clinical discussion there is a short chapter on the interpretation of the electrocardiogram and a new chapter on spatial vector interpretation followed by a discussion of the cardiac arrhythmias.

The remainder of the book contains a well-selected and reproduced illustrative group of 12-lead electrocardiograms, including the standard limb leads. The textual material is certainly not controversial. It is not written for the beginner in electrocardiography and because it includes the generally accepted theory and interpretations, it is not for the experienced electrocardiographer. There is a good bibliography arranged in alphabetical order, of the authors' last names, covering the present concepts in electrocardiography.

—*WILLIAM D. PRESTON, Col., USAF (MC)*

CHILDREN'S EYE PROBLEMS, by *Emanuel Krimsky*, M. D. 175 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1956. Price $6.

Although this book is intended primarily for the pediatrician and the general practitioner, the ophthalmologist will find it helpful in dealing with the child as a whole by emphasizing environmental, psychologic, hereditary, and systemic influences. The child psychologist, psychiatrist, and school nurse will find this book of value because emphasis has been placed on extraneous factors often responsible for a child's true or imaginary eye problem.

It offers a simple, practical screening method for the general practitioner or public health worker to detect possible eye disorders. False notions and misconceptions by the laity are discussed.

The author stresses that greater reliance is to be placed on objective examination in children. He gives methods of examination using simple instruments which have proved useful in his hands. The book is recommended for all those who see children in their daily practice.—*KENNETH E. HUDSON, Lt. Col., MC, USA*

MUSCLE RELAXANTS IN ANESTHESIOLOGY, by *Francis F. Foldes,* M. D. American Lecture Series, Publication No. 294, A Monograph in The Bannerstone Division of American Lectures in Anesthesiology, edited by *John Adriani,* M. D. 210 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $5.50.

Dr. Foldes is well known as an investigator in the field of anesthesiology and is well qualified to write a review on muscle relaxants as they are used in the practice of anesthesia.

The first 56 pages of this book deal with the chemistry, physiology, and pharmacology of muscle relaxants. The theories of the mode of action of polarizing and depolarizing relaxants is presented with very clear diagrammatic illustrations. The scientific discussion of the drugs, although technical, is clear and easy to follow.

The last hundred pages deal with the clinical application of the muscle relaxants. Dr. Foldes describes very specifically how he uses each drug, the indication and contraindication of each relaxant, and the complications that result from the use of muscle relaxants and the management of these complications. During his discussion of anesthesia for the aged, the asthmatic, and the cardiac patient, he brings out many fundamental principles of anesthesia.

I especially like the way each chapter starts with an outline, thus directing the reader to the highlights of the chapter. There is an impressive bibliography of 414 references and the index is adequate.

—DANIEL M. PINO, Comdr., MC, USN

POSITIONING IN RADIOGRAPHY, by *K. C. Clark,* M. B. E., F. S. R. 655 pages; 2,150 illustrations. 7th edition. Grune & Stratton, Inc., New York, N. Y., 1956. Price $29.

Through successive editions this text has been enlarged and modernized and has successfully followed the trend and new ideas in radiographic technic. The standard positions used in routine radiography, as well as the unusual positions required in special examination, are clearly described and illustrated. Line drawings and labeled photographs graphically correlate the external topography with the radiograph desired in a clear manner. Standard exposure factors are included for each examination.

Special sections on pelvimetry, placentography, dental radiography, myelography, stereography, and angiography are included. Notes on the use of contrast media and a section on radiation exposure are also of timely interest. The discussion of theory in each section makes the volume additionally useful to those engaged in teaching. The text is well indexed and the desired subject is readily found. The use of accessory equipment such as cones, grids, and special holding devices is well described.

The new edition continues to justify its earned position as one of the foremost texts on radiographic technic.

—SYLVESTER F. WILLIAMS, Capt., MC, USN

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be reviewed in a later issue.

WHEN DOCTORS MEET REPORTERS, A Frank Discussion by Science Writers and Physicians of the Controversy Between the Press and the Medical Profession, compiled by *Hillier Krieghbaum.* 119 pages. Published for The Josiah Macy, Jr. Foundation by New York University Press, New York, N. Y., 1957. Price $2.50.

ATLAS OF NEUROPATHOLOGY, by *Nathan Malamud,* M. D. 468 pages; 226 pages of photographs; 2 pages of color plates. University of California Press, Berkeley 4, Calif., 1957. Price $20.

PRINCIPLES OF UROLOGY, An Introductory Textbook to the Diseases of the Urogenital Tract, by *Meredith F. Campbell,* M. S., M. D., F. A. C. S. 622 pages; 319 figures. W. B. Saunders Co., Philadelphia, Pa., 1957. Price $9.50.

DISEASES OF THE NOSE, THROAT AND EAR, by *Howard Charles Ballenger,* M. D., F. A. C. S., and *John Jacob Ballenger,* B. S., M. S., M. D. 10th edition. 968 pages; 550 illustrations and 11 plates in color. Lea & Febiger, Philadelphia, Pa., 1957. Price $17.50.

The Principles and Methods of PHYSICAL DIAGNOSIS, Correlation of Physical Signs With Certain Physiological and Pathological Changes in Disease, by *Simon S. Leopold,* M. D., with a chapter on Sounds From the Thorax: Acoustic Principles, by *S. Reid Warren, Jr.,* Sc. D. in E.E. 2d edition. 537 pages; 379 illustrations and 25 color plates. W. B. Saunders Co., Philadelphia, Pa., 1957.

EXPERIMENTAL PSYCHOPATHOLOGY, edited by *Paul H. Hoch,* M. D., and *Joseph Zubin,* Ph. D. The Proceedings of the Forty-fifth Annual Meeting of the American Psychopathological Association, Held in New York City, June 1955. 275 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1957. Price $6.50.

BASIC FACTS OF PHARMACOLOGY, by *Stewart M. Brooks,* Ph. G., B. S., M. S. 323 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1957.

CLINICAL USE OF RADIOISOTOPES, A Manual of Technique, edited by *Theodore Fields,* M. S., F. A. C. R. (Assoc.), and *Lindon Seed,* M. D. 17 contributors. 455 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $9.50.

ON BECOMING AN EDUCATED PERSON, An Orientation to College, by *Virginia Voeks.* 147 pages. W. B. Saunders Co., Philadelphia, Pa., 1957.

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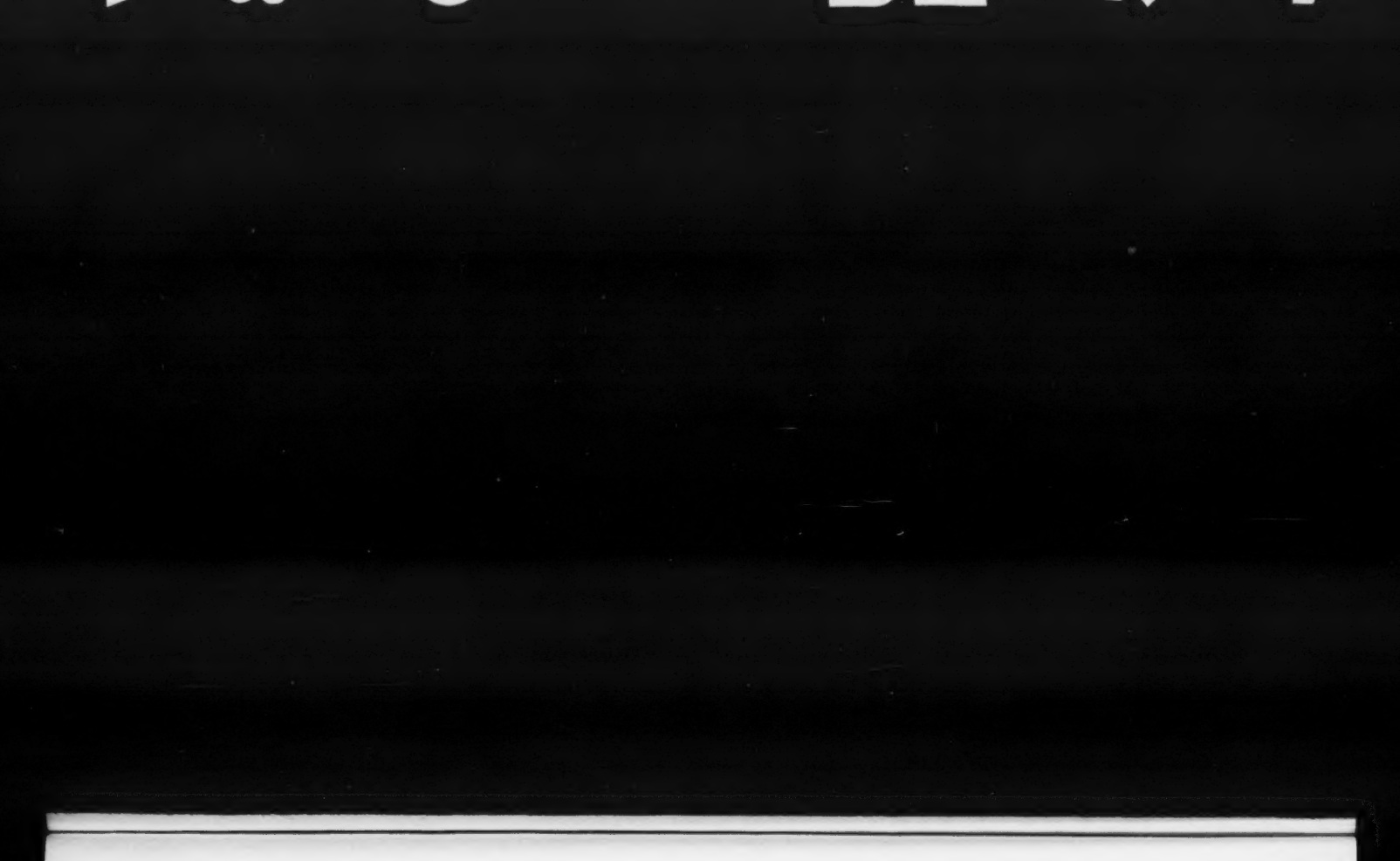
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